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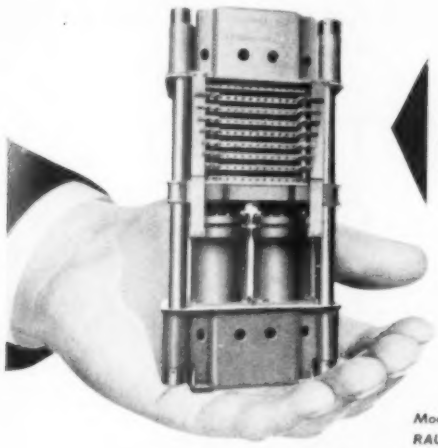

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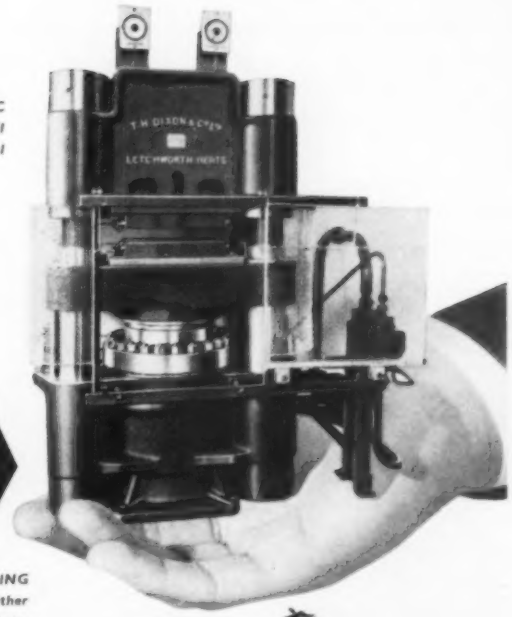

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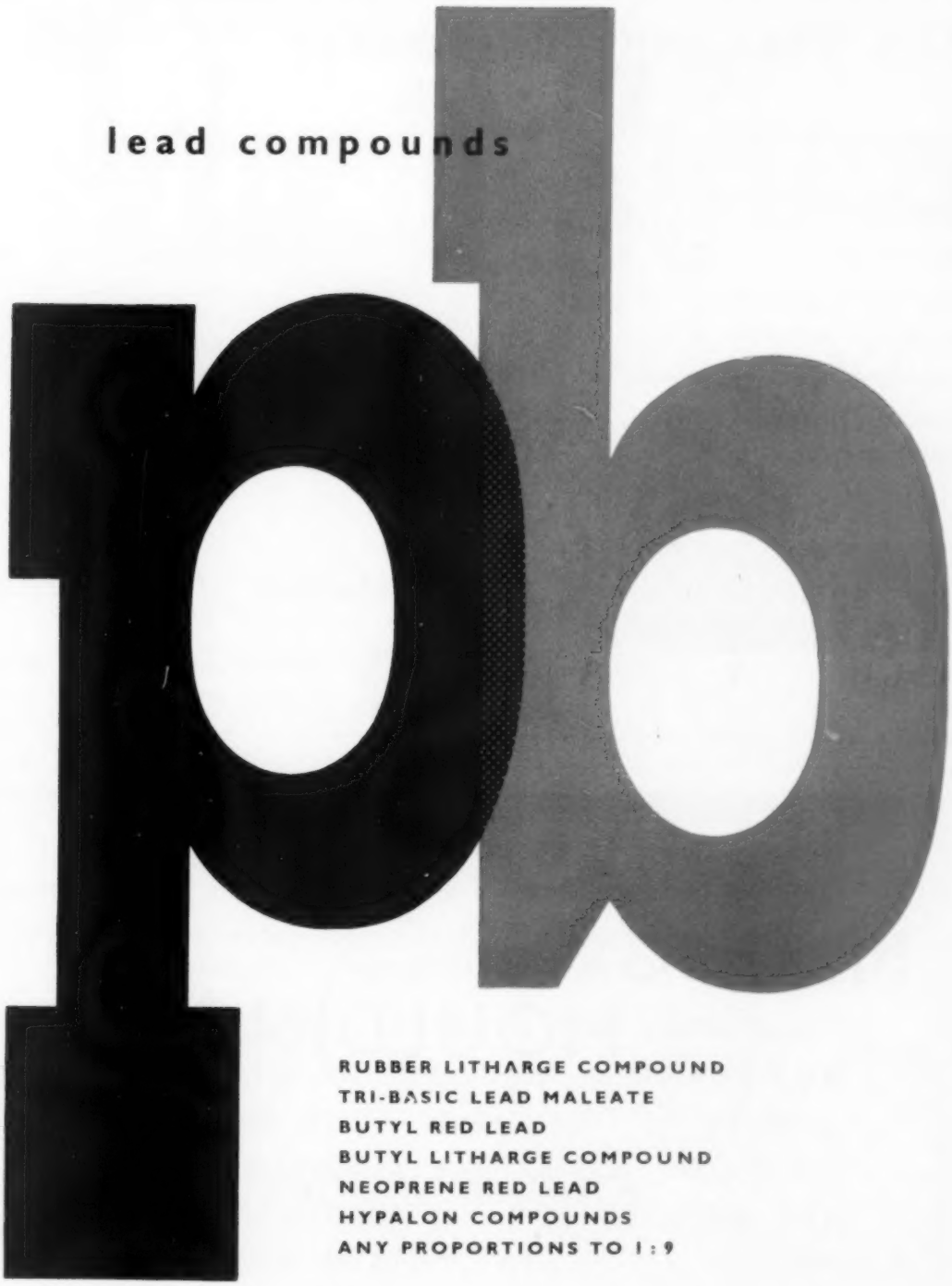

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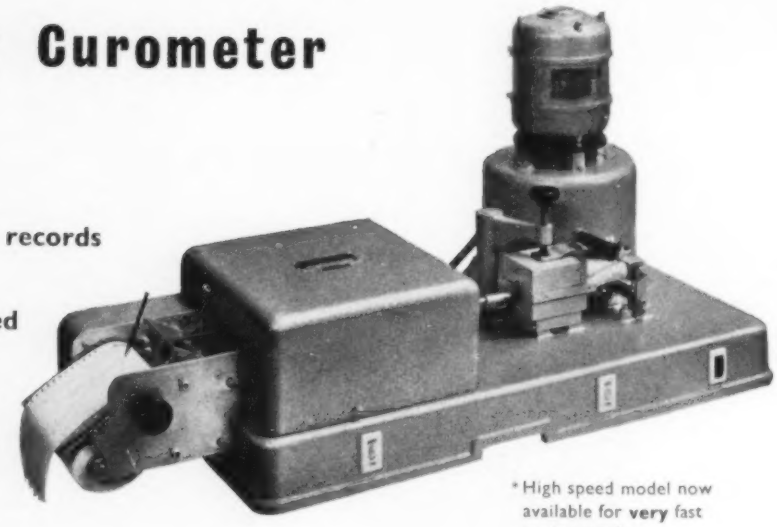

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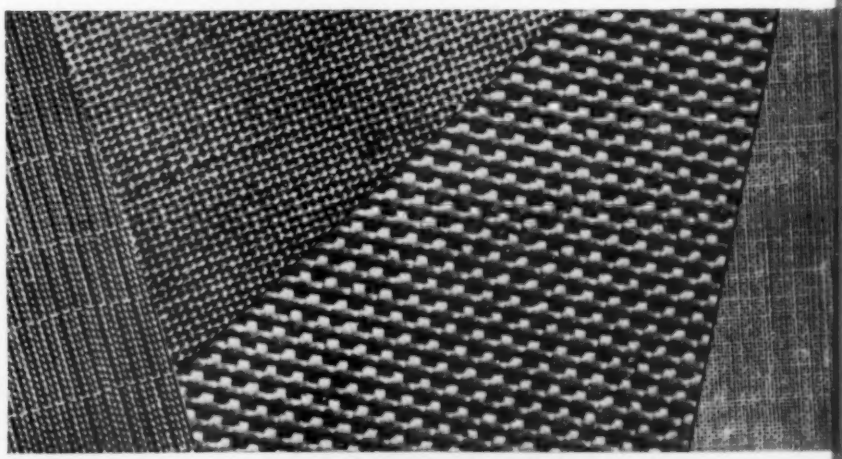

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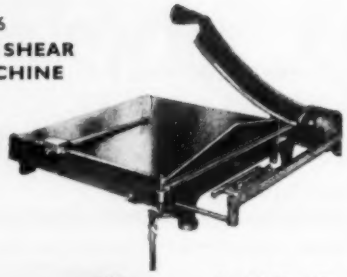

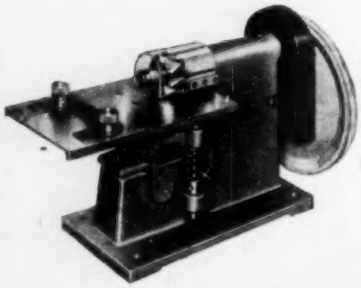

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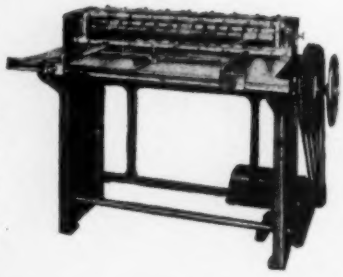

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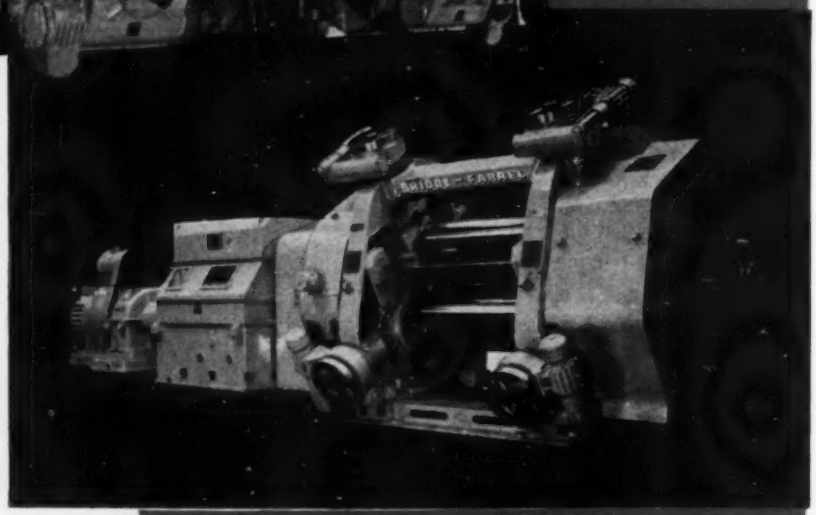

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RUBBER and PLASTICS WEEKLY

Formerly 'Rubber Journal and International Plastics'

Volume 140 *IN ITS 77th YEAR* **No. 22**

June 3 1961

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PGA 910

NOTES of the WEEK

Balancing Research Effort

BALANCING the research effort of the Department of Scientific and Industrial Research to meet rapidly increasing technological demands has been the main task of the Council for Scientific and Industrial Research recently. In their report for 1960, published this week,* the Research Council emphasizes that the steady expansion over the last two years — DSIR expenditure has increased from £8.9m. in 1958-59 to £12.2m. in 1960-61 — raises not only difficulties in the broad direction of scientific policy but also considerable administrative problems.

An important change in administration to give greater flexibility in long-term planning is dealt with in the report. The five-year plan is replaced by a new method of financial forecasting, under which the Council will agree each year with the Treasury, subject to approval by Parliament, (*a*) the expenditure for the following year, (*b*) reasonably firm estimates for the next two years, and (*c*) less definite forecasts for the fourth and fifth years. Under this much more adaptable — and more scientific — system estimates can be revised annually according to important unforeseen changes in the situation.

RAPRA's Plastics Progress

THE DSIR report shows that the movement for co-operative industrial research continues to grow. As a major development in this field it spotlights the coming together of rubber and plastics interests in the formation of the Rubber and Plastics Research Association. RAPRA's own report for 1960 indicates that an encouraging response has been received from many plastic firms, reflecting the groundwork that has been done over the past two years by the association and the British Plastics Federation. Many new companies have joined the association, and a number who are already members have agreed to pay increased contributions because of their interest in both plastics and rubber. (A list of these companies is published on page 834.)

The financial contributions received from these new members is being augmented by the Government. For every £100 provided by members over and above the previous grant terms, the Government will provide £100, up to a total of about £40,000. The RAPRA report states that the association has committed itself to attaining at least £20,000 from its new plastics members in each of the three years 1961-63. In all, the association will receive £77,000 from the Government if it reaches a maximum grant-earning income of £120,000 from the rubber and plastics industries together.

To any plastics firms who may be unfamiliar with the association's record, these very favourable Government terms are an indication of the encouragement that the Government is giving to this RAPRA expansion into plastics. It is important that these plastics firms — large or small — should consider joining the association. 'Research' tends to be a misleading term: obviously while a good deal of the work of RAPRA is long-term research work, about half the budget is devoted to development work and to technology and information services. These are of immediate benefit to any firm joining the association.

That this is not 'just another subscription' can be seen from a recent RAPRA plastics technical meeting, reported in last week's *RPW* (page 788), which discussed the programme of work on the plastics side. A number of valuable lines of work were proposed, one of the most important being testing and standardization. This would include evaluating test methods from standards; assessing new test apparatus and acquiring instruments needed only for ASTM or continental specifications, which it would be wasteful for any individual firm to buy; and weathering and wear tests. This is a good illustration of the kind of work that is ideally carried out by a central organization such as RAPRA. It is of immediate practical use, and saves the individual company a considerable amount of money and work.

Fire Warning Footnote

THE rubber and plastics industries both deal with solvents and other inflammable materials that are a considerable fire risk. Nowadays most firms in the industries are physically prepared for an outbreak, but it is more difficult to be psychologically prepared. Few people who have not experienced it can imagine the speed with which a fire can flare up and destroy an apparently indestructible building. On this page a few issues ago (*RPW*, May 13) we praised an article in a recent issue of the *Dunlop Gazette* which told the story of the disastrous outbreak at the company's main mill at Rochdale last year, not just as a story but as a warning; a warning about how quickly a fire can develop and spread. We suggested that it would be a good thing if reprints of the article could have a wider circulation throughout the rubber and plastics industry, since it is presented so vividly that it should make even the dullest employee more fire-conscious. Now Dunlop informs us that a limited number of reprints are available to interested companies. They can be obtained from the company's public relations department at 10-12 King Street, London, S.W.1.

**The Report of the Research Council of the Department of Scientific and Industrial Research. HMSO 4s.*

NEWS *Briefs*

SARNIA BUTADIENE PLANT — TYRE PLANT FOR TURKEY—DUNLOP'S RUSSIAN ORDER—JAPAN TO MAKE PHTHALIC ANHYDRIDE — PVC IN KOREA

●**Turkey** — Goodyear Tyre and Rubber Co. and the United States Rubber Co. are to build plants in Turkey which together will produce some 400,000 tyres and 300,000 tubes annually. This follows the acceptance of applications by the two companies to the Turkish Committee for the Promotion of Foreign Investments. Turkish capital in the projects will amount to 40%, while Goodyear will invest some T£54m. and US Rubber T£60m. Production is expected to start in two years time.

●**Russia** — The Dunlop Rubber Co. has been given a Russian order for 80 20-man self-inflating liferafts for Soviet ships being built at Telakka, Finland. The company says this is one of the biggest individual orders for their liferafts, and the second for Russian vessels being constructed in Finnish yards.

●**Malaya** — Japan will import more rubber from Malaya this year, said S. Ohagki, the leader of a 15-man Japanese rubber industry delegation in Kuala Lumpur. He declared that last year Japan imported a total of 160,000 tons of natural rubber, most of which came from Malaya, and expressed the hope that Japan and Malaya would co-operate more closely in the future in the improvement of natural rubber.

●**United States** — Goodyear International Corp. has reached an agreement with the Dunlop Rubber Co. (Malaya) Ltd., for the manufacture of a full range of Goodyear passenger and truck tyres under licence in the new factory which Dunlop is building in Petaling Jaya, Malaya. Production will be distributed throughout Malaya, enabling Goodyear to sell locally produced tyres in the market for the first time. Production in the new $25m. plant is expected to begin in mid-1962.

●**Singapore** — A delay of the largest of the three Russian steamers currently loading for May shipment is reported by trade sources. This delay means that at least 6,000 tons will not be cleared for inclusion in the May export figure. The sources add the Russian steamers are scheduled to load a total of 13,000 tons for May shipment. April carry over was 2,300 tons. It is pointed out that, with the advent of the better producing months, stocks locally should not decline to the level earlier estimated. Nevertheless, the lack of most grades for current shipment is constantly reported by upcountry centres and any consistent buying of lower sheets immediately causes a hardening of price.

●**Japan** — Nippon Shokubai Kazaku Kogyo Co. Ltd., of Osaka, recently completed construction of a phthalic anhydride plant with a capacity of 40m.lb. a year. Production is from orthoxylene. The total phthalic capacity of the company is now 140m. lb.

●**Canada** — Fluor Corp. of Canada Ltd. has been awarded the contract to perform the engineering, procurement, and construction of a new butadiene extraction unit at Polymer Corp.'s Sarnia complex. The new unit is said to be needed to match more closely the increased output of the butylene dehydrogenation plant recently achieved through process modifications, and to provide additional butadiene necessary to keep pace with the steady gain in output of SBR. Expected to cost in excess of $1.5m., the new facilities will be the first unit in the Western Hemisphere to use Shell Development Co.'s acetonitrile extraction distillation process. High purity of product is claimed to be possible under this newly developed extractive method. The design of the unit is now underway and completion of the project is scheduled for autumn this year.

●**Korea** — The Development Loan Fund in Washington has approved a loan of $3.3m. to the Puk Sam Chemical Industry Co., of Seoul, for the expansion of the company's plant to produce pvc and by-product caustic soda and chlorine. The new plant will have an output of 1,800 tons of pvc yearly for use entirely within the country with a resulting import saving of some $1m. per year.

●**United States** — The Kelly-Springfield Tire Co., a subsidiary of the Goodyear Tire and Rubber Co., is planning to begin construction immediately of a new $10m. tyre plant in Tyler, Texas. George B. Newman, the Kelly-Springfield Co.'s president, said the plant would produce about 4,000 passenger car tyres daily and output was expected to double in five years. Eventually, he said, the plant would also produce truck and tractor tyres. Production is scheduled to start next March.

'Why can't you leave your factory troubles behind you when you come home in the evening?'—539

£4m. Nylon Plant for Russia

VICKERS-ARMSTRONG'S ORDER AT MOSCOW TRADE FAIR

AN order for a £4m. plant for the manufacture of nylon 66 fibre for industrial yarn and tyre cord, has been gained by Vickers-Armstrong (Engineers) Ltd. at the Moscow Trade Fair, which ends tomorrow (June 4).

The plant will be supplied by Vickers in conjunction with its West German associate Hans Zimmer of Frankfurt. Zimmer will supply 25% of the technicians and 7% of the equipment.

At the same time as news about the order was released, Lord Knollys, chairman of Vickers, revealed that further negotiations were taking place with the Russians. If these are also successfully concluded, the firm may sell polymerization plants for SBR and also plant for the manufacture of polypropylene monofilament.

Best Available

The nylon 66 plant, which is expected to be completed by early 1964, will have a capacity of 6,000 tons, using the conventional method of dehydration of the salt formed from equimolar proportions of hexamethylene diamine and adipic acid.

Lord Knollys was quoted as saying that he believed the Russians had ordered the British-German plant 'because they want to get what they think is the best technical knowledge and equipment available at the present time. They could do it themselves but it would have taken them longer and they have so much to do'.

Effects of Moscow: page 830

Foster Yates Wins US Patent Case

Foster, Yates and Thom Ltd., of Blackburn, has announced that the terms of settlement of a patent infringement suit, brought by the company and Roland Wucher against Utrilon Industries (USA) Inc. in the US District Court for the district of Puerto Rico, have been approved by the Federal District Court of New York.

The US patent number 2903747 relates to the Foster-Wucher W700 injection moulding machine, which is widely used in USA and other countries for the production of plastics footwear and pvc soles.

Foster Yates and Thom is the exclusive licensee for territories other than France and the French Union, and is represented in USA and South America by the International Vulcanizing Corp. of Boston, Massuchusetts.

The terms of settlement include the acknowledgment by Utrilon Industries that it infringed the patent and the payment by it of substantial damages.

Laporte Department Moves

The technical service department of Laporte Titanium Ltd. moved to new premises at Harpenden, Herts., on June 1.

A laboratory there has been newly furnished and equipped and is set in sufficient grounds to provide a site for an additional pigments exposure station for testing the company's products.

Decision this Month on Polymer's Plant

A DECISION may be reached this month on whether Polymer Corp., of Sarnia, Canada, will construct a butyl rubber plant in the UK, writes our Canadian correspondent.

Recently E. R. Rowzee, president of the Crown-owned synthetic rubber company, gave the Canadian House of Commons public accounts committee details of the company's $40m. expansion programme. Three-quarters of this expenditure involves the creation of new plant facilities outside Canada, with the remaining quarter going into expansion of the existing facilities at Sarnia. One of the new units there will be a polybutadiene plant.

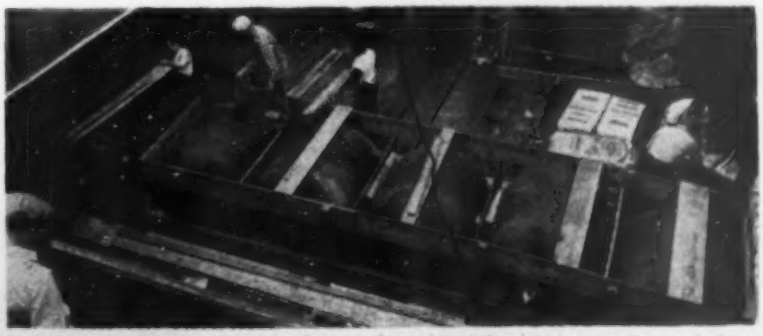
Polymer is already preparing plans for construction of a $12m. plant to manufacture butyl rubber through a subsidiary in Strasbourg, France, in which Polymer has a 95% interest, while a 5% interest is held by the Banque de Paris. Construction will start this summer and the plant will produce 10,000 tons a year, thus relieving the Sarnia plant and enabling it to produce a greater amount of standard synthetics.

Mr Rowzee told the committee that Polymer had to establish branch plants abroad in order to compete on export markets and meet the desires of foreign countries to produce their own synthetics. He contended that some producers of synthetic rubbers in other countries were anxious to cut down Polymer's present strong position in Europe; one way in which they could do this would be by building plants of their own there. 'The corporation has beaten its competition to the draw', he said.

Saleable Asset

Mr Rowzee added that Polymer's engineering know-how was a saleable asset. He said that Polymer was designing and supervising the construction of a plant in Mexico and that later the corporation might be permitted to join in its operation, as a partner.

The Canadian House of Commons' public accounts committee has voted against delving into the possibility of selling Polymer Corp. to private interests. Members of the committee upheld the contention of the steering committee that the question of selling the corporation is a matter of Government policy beyond the committee's terms of reference. The question was raised earlier this month by a number of conservative members of the committee, who contended the Government should sell the company to private enterprise.



Ten tons of rubber are uncrated at an American pier in an experimental shipment of latex in rubber drums. United States Rubber Co., developer of collapsible containers called Sealdrums, is making the test shipments from its plantations in Malaya. The filled containers are stored in the ship's hold like giant eggs in a carton. Each Sealdrum holds 500 gal. of latex and when empty occupies little storage space

B1

Inadequacies of Testing

IRI FOUNDATION LECTURER ON POLYMER COMPLEXITY

THE 16th foundation lecture of the Institution of the Rubber Industry was delivered at the Birmingham and Midland Institute, on Friday June 2 by J. W. Denson, FIRI (Goodyear Tyre and Rubber Co.).

Mr Denson said that the service requirements of different rubber products, plus the uncertainties of laboratory tests as a means of forecasting service life, caused the costs of testing compound changes in certain products to be extremely high. This in its turn, he said, caused marked differences in the attitude of compounders associated with different products.

He considered that abrasion test machines were notoriously poor forecasters and suggested that a different method of approach to the problem was needed. Over 2,500 materials were now available to the compounder and the number continued to grow. This situation called for even greater efforts on the part of the suppliers to sell their products on the basis of technical information and service.

The polymer situation, declared Mr Denson, was growing rapidly in complexity. He introduced a simple classification scheme to render the polymer picture more easily comprehendable. This provided a picture of five families, 19 genera and over 140 species of polymer used in rubber manufacture.

The speaker went on to discuss the influence of stero-specific rubbers and the future of natural rubber, and outlined processing improvements and the deficiencies of present day mixing methods. He concluded by stressing the need for more science graduates in compounding, and suggested the public schools as a possible source of increased entry to rubber colleges.

A more detailed description of Mr Denson's lecture will appear in next week's *RPW*, together with an impression of the occasion in sketches by Fred May.

Another Goodyear Latex

A new synthetic latex which is said to provide improved adhesion between nylon or rayon fabrics and rubber or rubberized fabric materials has been announced by the chemical division of Goodyear Tyre and Rubber.

A spokesman for the division's coating department said the latex, Pliolite VP-100, will be applicable to tyres, conveyor belts, hose, V-belts, inflatable products and tarpaulins.

Made from vinyl pyridine, styrene and butadiene, the latex is recommended by the company for tyre cord dips to improve adhesion between the tyre fabric and rubber carcass — particularly in tubeless tyres.

The latex can be used as the main ingredient in fabric dipping compounds or blended with other synthetic latices. The ratio of Pliolite VP-100 to other latices can be varied to bring out the best properties in any particular application.

Pliolite VP-100 is claimed to reduce cord fatigue, has improved processing characteristics and excellent mechanical, chemical and storage stability. These advantages, coupled with improved adhesion, lessen the chance of ply separation in the finished product, the spokesman declared.

The material is being produced in USA at Goodyear's Akron synthetic plant.

Allied's First Product

RANGE OF PIPES AND FITTINGS IN MEDIUM IMPACT PVC

THE first product to be manufactured by the recently formed Allied Structural Plastics Ltd., is medium impact rigid pvc pressure pipe, which is being marketed under the trade name of Aspect. It is made in sizes from 1in. to 6in. diameter, in three classes, suitable for working heads of 200, 300 and 400ft., and with a wide range of fittings. Allied Structural Plastics is the new company formed by Universal Asbestos Manufacturing Co. Ltd. and Thermoplastics Ltd. to develop plastics products for the building industry.

FIND YOUR WAY ROUND

INTERPLAS 61

International Plastics Exhibition at Olympia June 21-July 1

The June 17 issue of *Rubber and Plastics Weekly* will be a special exhibition issue providing a quick, unique guide to Interplas 61. It is sectionalized by methods of fabrication—Extrusion, Injection Moulding, Vacuum Forming, Casting, etc.—so that a visitor can mark off immediately stands he is interested in. Extra copies are available from 131 Great Suffolk Street, S.E.1. or from our stand at the exhibition—BB537.

The pipe is recommended by the company for water mains, chemical process piping and waste drainage, oil and natural gas piping, air conditioning installations, water filtration and sewage plant, and electrical conduit.

Allied Structural Plastics comments that there is, at the moment, no British Standard for pvc water mains, but many thousands of kilometers have already been installed in Holland. Aspect pvc pipe is said to be made of specially compounded material suitable for portable water services, and passes the tests laid down by the Dutch Institute for Testing Waterworks Materials (KIWA) and by the World Health Organization.

The pipe is produced in standard 20ft. lengths, the joints being made with a special solvent welding cement which is applied by brush. The joint develops adequate strength in about two minutes and can be pressure tested in 12 to 24hr.

Normal methods can be used for laying, but the company will point out to the building trade that it is frequently possible to make the joints and carry out pressure testing above ground, as the pipe is flexible and light enough to be lowered into trenches in long lengths of 50yd. or more without damage. A further advantage of above ground assembly is that narrower trenches are possible, thus saving excavation costs.

Pvc pipe is particularly suitable where ground movement is to be expected; it is resistant to corrosive soils and to a wide range of chemical compounds and it has a smooth internal surface and high flow capacity. Installed costs are low — from 17s. 6d. to 25s. 6d. a yd. for 3in. main suitable for a working head of 200ft.

Fittings include sockets, reducing and threaded bushes, tees, elbows, saddles, flanges and end caps.

The pipes and fittings are being distributed by Universal Asbestos.

Deeglas Fibres

Glass Yarns and Deeside Fabrics, a member of the BTR Industries group, changed its name to Deeglas Fibres on June 1. New offices for the company have been opened at Prince Consort House, 27-29, Albert Embankment, London S.E.1.

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INTOL in shoes. In light shoes, heavy shoes, work shoes, play shoes. INTOL fashionable, INTOL plain, INTOL coloured. To manufacturers of footwear and to manufacturers in every industry INTOL SB Rubber has these advantages: stable price, consistent quality, assured, punctual delivery from stock. INTOL is the only SB Rubber manufactured in bulk in Britain, it is produced by I.S.R. for Britain's rubber users and backed by an active Technical Service. This Service is available to manufacturers in every industry; it tests and compiles its findings into useful production reports, provides valuable compounding and processing data, it treats each customer individually and confidentially, it comes to you and costs nothing. You can use INTOL: contact I.S.R. and find out how.

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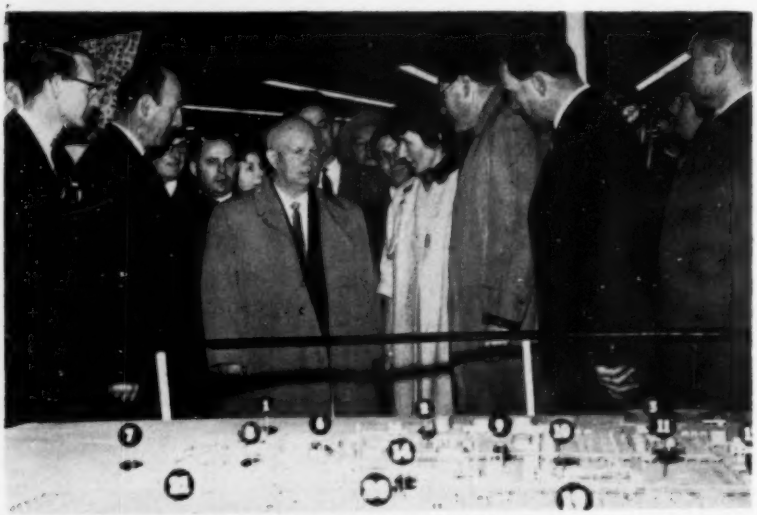
B2

The Effects of Moscow

GREAT OPPORTUNITIES FOR UK POLYMER AND PLANT EXPORTS TO USSR

ONE of the biggest orders taken at the British Trade Fair in Moscow, which ends tomorrow (June 4), was for a complete polymerization plant for the manufacture of nylon 66 (page 827). Gained by Vickers, the order like that granted by Russia to I.C.I. for the supply of a polythene plant, spotlights the export opportunities that Russia offers for the UK rubber and plastics industries.



Mr Khrushchev and Mr Maudling, President of the Board of Trade, discuss the various interests of the Distillers Co. Ltd. with Major D. A. Blair, a DCL director, at the British Trade Fair. In the foreground is part of a scale model of British Hydrocarbon Chemicals Ltd.'s Grangemouth petrochemical complex, jointly owned by Distillers and British Petroleum

In terms of plastics production, Russia is still a long way behind the West. Of the world's turnover in plastics for 1959, amounting to some 5.6m. tons, Western countries accounted for 87%, while the East is accredited with the remaining 13%. However, this situation is only temporary. The increase in plastics production in the USSR is extremely rapid.

Russia, with her enormous population, huge and rapidly-increasing industrial power and steady progress towards higher standards of living provides, at any rate in the immediate future, an almost unlimited market for both plastics products and the means to make them.

The Soviet journal *New Times* quotes the following figures for 1961: Investments in the chemical industry up by 42%, 40% in iron and steel, chemical industry's output up by 14.5% with plastics and resins up 32% and synthetic fibres up 20%.

Output of producer goods will rise by 9.5%, and consumer goods by 6.9%. In 1961 national income will be raised by 9%, incomes in many categories will be up 5%, retail sales up 5.8%, with television sets increased by 14%, radio sets by 13% and refrigerators and washing machines will be increased by a factor of 1.5 Between 9m. and 10m. people will move to new homes.

Increasing Demand

If all this comes about and future years follow similar lines, or perhaps increase the rate of progress, Russia is going to need an almost fantastic increase in consumption in order to continue the improvement in her standard of living. The proportion of consumer goods manufactured from man-made materials is increasing and industrial applications for plastics are becoming increasingly important, particularly in the fields of protective coatings, chemical plant, transport, belting and hose, agriculture, building, and electronics.

According to information published by the Russo-British Chamber of Commerce, the Soviet chemical industry will increase its output approximately three-fold in 1965 compared with 1958, and output of plastics and tars will increase more than seven-fold. Expenditure on chemical plant in 1965 will total 3,500m.-3,700m. roubles (one new rouble equals £1 sterling), an increase of 220-240% on the 1958 figure. It is undoubtedly true that in order to approach this the rate of increase of production must be rapidly stepped up.

The official statistics released in October 1960 state that gross output in the chemical and rubber industries in the first nine months of 1960 exceeded output in the corresponding period of 1959 by 11%. Chemical plant was produced during the nine months to the value of 1,600m. roubles, an increase of 38% on the corresponding period of 1959'. The following specific increases in output were recorded:—

	%
Synthetic resins and plastics	12
Phenol-formaldehyde resins	16
Carbamide resins	53
Polystyrene and copolymers thereof	24
Polythene	54
Synthetic ethyl alcohol	15

As to the Soviet requirements for chemical plant, their imports of this in 1959 totalled 461m. roubles, as against 202m. roubles in 1958. Of this, imports from the UK were 133.9m. roubles and 25.1m. roubles respectively ('old' roubles at 11.2 to £1).

UK Assistance

British manufacturers can help with this programme in several ways. By providing the USSR with the equipment which she needs to build her own production facilities to the levels specified in her present seven-year-plan. Britain, with her history of engineering achievements, is in an ideal position to supply this type of heavy industrial machinery and chemical plant. The Rustyfa Consortium has already proved how successfully it can cope with large-scale projects as shown by the Dneipropetrovsk Tyre Factory.

By supplying the USSR with technical 'know-how' on operating these plants. According to Dr J. C. Mackay, chairman and managing director of Francis Shaw and Co. Ltd., UK exports to the USSR of rubber and plastics fabricating machinery were worth £26,000 in 1957; £1,837,000 in 1958; and

behind every *Francis Shaw* machine

research design quality engineering

SHAW McNEIL
18" x 18" MODEL 300
Mechanical goods press for quick transfer moulding of close tolerance parts.

PHOTO No. A789

A50

Shaw-McNeil mechanical goods presses (for light and heavy duties) are designed for higher production rates. Fast curing cycles are assured by moulds in permanent contact with the platens, avoiding the need for warming up, and economising in heat. Savings in excess of 40 per cent in curing time are not unusual.

- Electronic operation and automatic timing of cure and bumping sequences
- Adjustable ejector mechanisms strip finished components from moulds for easy removal
- Load gauges on heavy-duty presses maintain pressure throughout production runs and prevent ovalisation

Francis Shaw

FRANCIS SHAW & COMPANY LIMITED, MANCHESTER 10, ENGLAND

TELEGRAMS: "CALENDER" MANCHESTER TELEPHONE EAST 1010

OVERSEAS AGENTS THROUGHOUT THE WORLD

£6,545,000 in 1959. By supplying chemical intermediates and specialized raw materials. As far as consumer goods are concerned, Britain can, as a fairly short-term policy provide intermediate fabricated products for Soviet industry, such as pvc and Terylene conveyor belts, pvc, polythene and polypropylene sheeting for fabrication in the USSR into corrosion-resistant chemical plant.

The UK can also supply intermediate materials for the Russian consumer market. These could include the latest types of polystyrene sheeting for vacuum forming, polythene sheeting and layflat tubing for packaging, building, agriculture, and so on. Finished consumer goods could also be exported, to fill in the time gap before the USSR's own plants are ready.

Laporte Buys German Firm

LAPORTE INDUSTRIES LTD. has agreed to acquire all the issued share capital of Elektrochemische Werke Munchen AG, one of the major German producers of hydrogen peroxide by the electrolytic process, organic and inorganic peroxides, persulphates and chlorites and other chemical products. The principal customers of EWM are in the plastics and chemical industries. This acquisition, says Laporte, provides it with the opportunity to invest its know-how in the continent of Europe. Laporte's is a cash plus share offer, amounting to £1,506,629 at present market prices.

Geoffrey Hickson, managing director of Laporte Chemicals, L. H. Binding, group chief accountant of LIL and Dr J. Strobl, will join the board of EWM, Dr K. Merck, the present chairman of EWM, will retain his position.

Plastics Terminology

A session on multi-lingual plastics dictionaries and word-lists is to be held at the Europlastica 61 (Ghent) Belgian exhibition on June 19.

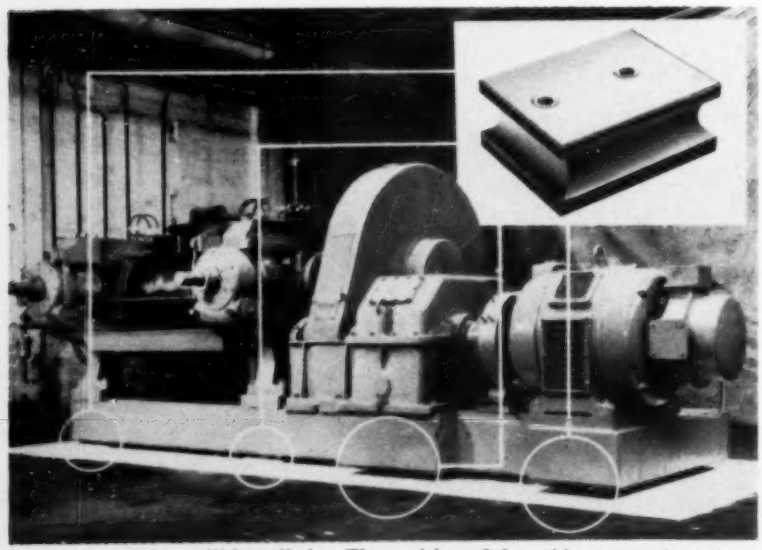
J. B. A. Nijssen, organizing secretary of The Applied Linguistics Foundation, will report on a similar session that was held in Utrecht (Netherlands) on October 22, and this will be followed by an informal discussion. Details can be obtained from Mr Nijssen at Post Office Box 6050, The Hague-West, Holland.

Rubber Mountings Cut Installation Costs

PHOENIX RUBBER CO. LTD., of Slough, which is producing anti-vibration mountings, recently applied them when installing a new 60in. rubber mixing mill in its own factory. The mountings used were designed by the company's associates, Gesellschaft Fur Technischen Fortschritt, MBH of Koblenz.

Phoenix was able to install its 22 ton mill on a 5in. bed of concrete — compared with the 4ft. 6in. usually necessary for such an installation — and simply lowered the machine on to a number of carefully sited and aligned mountings.

Phoenix claims that, using these mountings, and advice from its associates, the engineering staff of an average factory can carry out similar installations with a considerable saving of time and money.



The 22 ton mixing mill installed. The position of the rubber mountings (*inset*) **are ringed**

Dunlop Ready for a United Europe

DUNLOP RUBBER CO. LTD. was prepared for a united Europe, indicated the chairman, Sir Edward Beharrell, at this week's annual general meeting. For a number of years, Sir Edward said, the company had been examining how best it could prepare itself for any eventuality.

'Each division (of the company)', he went on, 'has been required to study the European market, to consider the modifications that may have to be made in its organization and products to take account of changing conditions, and generally to equip itself for the future challenge. Needless to say, an exercise of this kind, even if primarily directed towards Europe, strengthens a division's effectiveness in other markets as well'.

Referring to the prospects for the current year, the Chairman said: 'For the year as a whole it is too early to say how we shall fare. Like all manufacturers as widely based as we are, we cannot isolate ourselves from the economic conditions of the world's many parts.

'We are not however, dissatisfied with the prospects and forecasts of most of our divisions and companies and we have good reason to hope that our current year's results will show further progress'.

Subject to unforeseen circumstances, the interim dividend for 1961 will be increased in order to reduce the disparity between the interim and final payments but this, it was added, should not be taken to imply a higher distribution for the year.

The company meeting will appear in full next week.

Fire at Phillips

Fire broke out at the Manchester factory of Phillips (Bros.) Manufacturing Ltd. early on Tuesday (May 30). Fifty firemen fought the blaze.

The outbreak is said to have started in the mill room and brought down electric cables. This means that production will be held up for some time.

Part of the stock of rubber heels and soles was destroyed and on Wednesday morning clearing up operations were still going on.

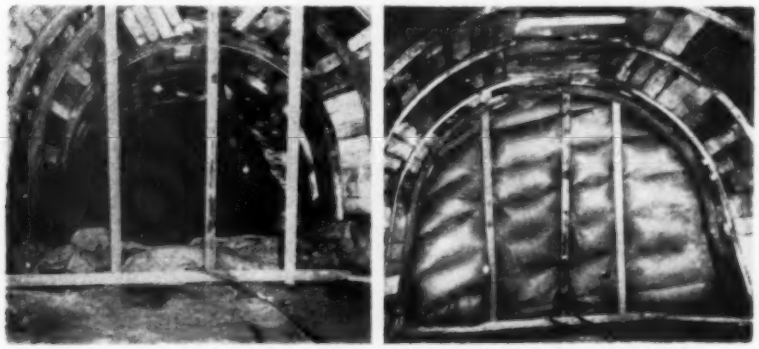
Drawing Office Exhibition

Advances in equipment for draughtsmen will be shown at the Drawing Office Equipment and Materials Exhibition which takes place from June 5-8, at the Royal Horticultural Society's New Hall, Westminster.

Latex Safety Aid for Mines

DUNLOP CHEMICAL PRODUCTS DEVELOPS CHLOROPRENE SEAL

TWO new safety aids have been developed by Dunlop for the mining industry, for the sealing off of underground heatings. One, a chloroprene latex spray, is the result of three years' research and practical experiments by the West Midlands Division of the National Coal Board and the Dunlop Chemical Products Division. It has already been used successfully on several serious heatings, at least one of which threatened to close a Warwickshire colliery.



The pvc glass-fibre seal before inflation (*left*) **and in position** (*right*). **The seal cuts off air feeding underground heatings and prevents smoke and fumes reaching other parts of the pit**

The other safety aid is an inflatable seal, manufactured from pvc reinforced with glass fibre, which can be put into position in a few minutes to reduce the volume of air, smoke and fumes, so that the stoppings can be built quickly in a respirable atmosphere without workers being hampered by breathing equipment.

When a seam is opened up in a mine, the adjoining strata and unworked areas of coal tend to split as settlement takes place in the areas from which the coal has been extracted. Air percolates into the fissures and can cause a form of spontaneous combustion, generally known as a heating. Speed is essential in dealing with a heating as soon as it is detected.

Sandbag Barrier

The routine method of treatment is to cut off the air supply and prevent noxious fumes given off by the heating from reaching other parts of the pit by sealing off the affected area. Without an air supply, combustion gradually dies out. A common method of sealing is to erect a barrier of sandbags, and to plug crevices in the barrier and the surrounding ground with sand or clay. The sandbag barrier is normally the first line of defence; when a more permanent and effective seal is needed a brick wall is erected. But this takes considerable time and effort to erect.

Neither method provides a complete seal against air reaching the heating or fumes escaping from it. There are still small crevices between the seal and its surroundings, and in the adjoining coal and stone. Various methods, such as filling in with stone dust, and pumping in a cement mix under pressure, have been used to provide the final sealant, but none has had complete success.

Cocooning Method

In order to tackle the problem, the West Midlands Division of the NCB sought the help of the Dunlop Chemical Products Division. This gave rise to the latex sealant, the development of which was described by R. R. Stapleton, latex development manager of the Dunlop Division, at a recent conference of mines rescue superintendents.

Dunlop was asked to provide a sealant to the following specification:

1. Non-inflammable both during and after application.
2. Non-toxic at all stages.
3. As inexpensive as possible.
4. A one-shot material, which could
5. be applied rapidly and simply by spraying.
6. Capable of being stored ready for any emergency but must
7. dry out rapidly after application.
8. While still wet it would have to stay where it was applied and
9. adhere tenaciously when dry.
10. It must dry out to give a film sufficiently rubbery to withstand settlement and strata movement and yet the film must be mechanically strong and resistant to abrasion.
11. Above all it must be impervious to the passage of gases both when wet and dry and
12. once applied the seal must remain effective for long periods.

The original idea was to develop something like the cocooning of

Continued on page 834

Spraying the chloroprene latex. An 80sq. ft. stopping can be sealed off by this means in about ten minutes

RAPRA's Memorable Year

WIDE INTEREST IN FLUID-BED TECHNIQUE

THE 1960 annual report of the Rubber and Plastics Research Association cites the year as a 'memorable one', with the adoption of the new name and constitution which will enable it to greatly increase its activities in plastics.

D. B. Collett, chairman of the RAPRA Council, states that the attainment of the maximum grant earning income is the most notable item in the accounts. Revenue in total has increased by £7,868. The year closed with an excess of income over expenditure of £14,398, of which £14,000 has been transferred to the development reserve.

Work at Shawbury resulted in an increasing number of visits, Mr Collett says, members showing particular interest in the use of the quick-lime-oil compounding ingredient to cut down porosity in open cures, and in the fluid-bed technique of vulcanizing. Six demonstrations of the fluid-bed were given during the year, each to several firms, and others are being planned.

The staff numbered 122 at the end of 1960 — an increase of 50% over the 1958 level. 'An increase of the middle grades of the Technology Division has been the main direction of the new employment', says Mr Collett. 'That rare bird, a latex technologist, has been winkled back from glass technology. A small but active latex laboratory is now in being'.

Research Programme

A report by Dr W. F. Watson, director of research, covers a representative selection of items from the research programme in which good progress has been made, one of the most important being the fluid-bed technique mentioned previously. In collaboration with the Natural Rubber Producers' Research Association research was carried out on the possibilities of graft-polymers as rubber textile adhesives, particularly for rayon tyre cord to carcass stocks. Results justify proceeding to larger scale testing under service conditions. Another research item dealt with the behaviour of dicumyl peroxide towards polymers, allowing some 'very worthwhile and interesting free-radical chemistry to be undertaken'.

The change of properties on loading high density polythene with a series of fillers was the subject of another investigation. Results showed that cheap, non-reinforcing fillers produced a marked reduction in impact strength and increase in flexural strength. Silicas and blacks gave a higher level of properties.

The most important event connected with the dynamic testing of properties of rubbers, says the report, was the publication of the book 'Engineering Design with Rubber' by A. R. Payne and J. R. Scott.

Other items dealt with include a new form of rubber packaging developed for the Ministry of Aviation, network theory and its application, and safety in laboratory mills.

The annual general meeting will be held on June 14 at 12 noon at the Piccadilly Hotel, London, W.1.

Plastics companies and others who have joined the association on or after January 1 1961 are: Albright and Wilson (Mfg.) Ltd.; Bakelite Ltd.; BIP Chemicals Ltd.; Birkbys Ltd; Bone Bros. Ltd.; Bradley and Turton Ltd.; Bright Manufacturing Co.; Catalin Ltd.; The Chemical Supply Co. Ltd.; Cooper Plastic Foams Ltd.; Cosmocord Ltd.; Cravens Ltd.; Crystalate (Mouldings) Ltd.; Du Pont Co. (UK) Ltd.; Duraplex Industries Ltd.; Ekco Plastics Ltd.; Enfield-Standard Power Cables Ltd.; Erinoid Ltd.; Farmiloe Sealants Ltd.; Fibreglass Ltd.; Formica Ltd.; Fothergill and Harvey Ltd.; F. Francis and Sons (Holdings) Ltd.; Fraser and Glass Ltd.; Gourock Ropework Co. Ltd.; Hampden Equipment; Thomas Hedley and Co. Ltd.; Industrial Mouldings (Warwick) Ltd.; Lankro Chemicals Ltd.; Leicester Lovall and Co. Ltd.; Chas. Lowe and Co. Ltd.; May and Baker Ltd.; Melwood Thermoplastics Ltd.; The Metal Box Co. Ltd.; P. H. Muntz and Barwell Ltd.; Michael Nairn and Co. Ltd.; Natural Rubber Producers' Research Association; James North and Sons Ltd.; Permali Ltd.; Plysu Products Ltd.; Prodorite Ltd.; The Projectile Engineering Co. Ltd.; Punfield and Barstow (Mouldings) Ltd.; Pure Chemicals Ltd.; Stewarts and Lloyds Plastics Ltd.; Vinatex Ltd.; Yorkshire Imperial Metals Ltd.

The following companies, already members of the association, are paying increased contributions towards the widened field of research to be carried out under the new constitution: Armstrong Cork Co. Ltd.; A. Boake, Roberts and Co. Ltd.; Cabot Carbon Ltd.; Distillers Co. Ltd.; Fawcett Preston and Co. Ltd.; Geigy Co. Ltd.; I.C.I. Ltd.; Ioco Ltd.; Monsanto Chemicals Ltd.; Saunders Valve Co. Ltd.; Francis Shaw and Co. Ltd.; Shell International Chemical Co. Ltd.; Smiths Motor Accessories Ltd.; J. M. Steel Co. Ltd.; and Whiffen and Sons Ltd.

RAPRA's Plastics Progress — page 825

LATEX SAFETY AID FOR MINES

Continued from page 833

machinery, but this involved the use of inflammable solvents which cannot be used in a mine. This meant that a latex had to be used for the sealant. Polychloroprene was chosen because of its non-inflammable nature and its good film-forming properties.

The development work on the sealant included long term storage and accelerated ageing tests, the latex being compounded with stabilizers, antioxidants and acid acceptors until the desired properties were obtained.

Impervious Film

The sealant can be rapidly applied at the rate of two or three gallons a minute. The resulting dried film has a tensile strength of over half a ton (average value 1,266lb.) per sq. in.; it does darken on continued exposure to light but specimens have showed no deterioration on continued exposure to light. Tests indicate that the film is almost completely impervious to air. Experiments using high pressure apparatus for testing tyre inner tubes have shown that the amount of air that can be forced through a perfect film is so small that, if it were part of a stopping $\frac{1}{8}$in. thick under a pressure of 3in. water gauge, only one cu. ft. of air per min. would pass through a stopping 26m. sq. ft. in area.

The Inflatable Seal

Developed by the Dunlop Rubber Co., the inflatable pvc/glass fibre seal reduces air entering an affected district by 90-95%. It can be carried by one or two men and erected in 5-10min.

It is non-inflammable and is inflated by compressed air through a central reed which disperses it to all parts of the structure (see illustration). The seal is quilted to ensure its sealing qualities in a wide range of irregularly shaped apertures and is made to cover roadways up to 12ft. wide and 10ft. 6in. high.

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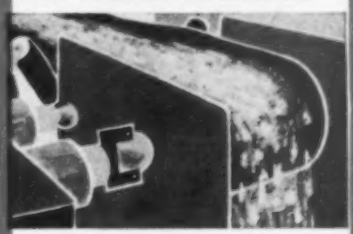
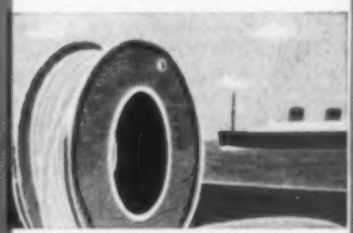


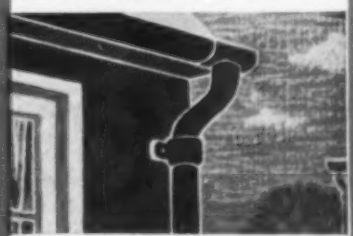
BUTYL FOR HEAVY INDUSTRY

This Butyl-covered conveyor belt at I.C.I., Billingham, has outlasted four ordinary belts and is still going strong.



BUTYL FOR ELECTRICAL INSULATION

Supertankers and liners have been wired throughout with Butyl-covered cable—lighter, smaller, (therefore less costly), with greater resistance to heat, ozone, moisture.



BUTYL FOR BUILDING

The building industry uses foam Butyl as a joint seal for gutters. It makes the perfect seal: easy to install, flexible, and absolutely waterproof.

VIEWS and REVIEWS

RUBBER does not lend itself to homecrafts in the way that wood or iron or even plastics do. Nobody would try to make his own tyres or foam rubber mattress — although having an old one of each, he might manage to make a doormat or a loose-cushion — but there is little he could make from the primary raw material.

Do it Yourself

With plastics, however, it is surprising how many factory processes can be adopted or adapted for home use. I do not mean just sawing and carving and screwing and sticking and the other conventional processes but those specifically designed for and directed at utilizing the distinctive properties of the plastics materials, especially, of course, the thermoplastics.

For instance, in *Der Plastverarbeiter* for April 1961, Vol. 12, No. 4, pp. 163-4, H. H. Reinsch describes the possibilities opened up by the development of a new, hot-air welding pistol, which by means of an electrically-heated chamber between the handle and the nozzle, emits a current of air or other gas at 100°C. above the melting point of the plastics material being welded, say, 200-250°C. for pvc, 250-300°C. for pib, and about 300°C. for polythene.

The article describes the techniques in detail in a way suitable for use at home or in the factory. The air must be free from oil, and for polythene it is desirable to use nitrogen in order to avoid oxidation. The various types of join, using filler rods, fillets, and plain laps are described and represented diagrammatically.

But if you are a beginner, needing general guidance on the joining of the thermoplastic parts, especially sheet material, you should read the survey by H. Domininghaus in *Kunststoff-Rundschau* for March 1961, Vol. 8, No. 3, pp. 107-111, which, though chiefly concerned with the polyolefins, is of general interest and value also.

The author deals first with the adhesive joining of polyolefins, together or to metals, giving 17 literature references to adhesive materials and processes, but he prefers welding as being more positive, reliable and lasting. He enumerates seven different welding methods (and gives 42 literature references about them) which are: heater bar, dielectric or HF welding, hot-gas with filler rod, heated tool, resistance- or induction-heating, friction welding, and hot-wire welding.

For polyolefins, because of their non-polar nature, high-frequency welding or sealing, so popular with pvc, is not suitable, but other processes are described here in some detail.

The article ends with short descriptions of fabricating by means of sawing, boring, turning, planing, milling, stamping and punching, and polishing.

Simplified Laying of GRP

A few years ago in Dusseldorf, I had the pleasure and instruction of examining Aust and Schuttler's machine for the simultaneous spraying of fibre and resin in the laying down of sheets of GRP, and I felt at the time how much it simplified not only factory work but also opened the possibility of a do-it-yourself system for amateurs. I was pleased to see a description of the machine in the March 1961 issue of *Kunststoff-Rundschau* pp. 111-4.

Of course this is not a toy but a large machine capable of producing large items, some of which are depicted and include boat and vehicle bodies, sinks, tanks, baths, and a wide variety of containers.

The fibres, frequently glass-fibre rovings, are cut and then blown in an air stream to a pistol head (in the portable model) whence a stream of the liquid, mixed, accelerated resin is simultaneously ejected, thus laying down on a suitable former a layer of fibre-reinforced resin. The apparatus, which is also available in the USA through the Rand Development Corporation of Cleveland, has several useful modifications of the main principle and accessory items permitting a wide range of uses and flexibility in difficult applications.

GRP Tank Linings

The truth is that glass-fibre-reinforced plastics, however made, are still in the manual, do-it-yourself stage. Some methods have more, some less, help from machinery.

The lining of large tanks must always remain a manual job. *Industries des Plastiques Modernes* for March 1961, Vol. 13, No. 2, pp. 54-5, has a well-illustrated description of the coating of the interior of a metal tank with an anti-corrosion layer of a stratified polyester. The tank was about 20ft. in diameter and 12ft. high.

The inside was first cleaned by sand blasting and this was followed by painting-on a protective layer of resin, which in the preliminary trials was an epoxy but in later work it was found that a cheaper polyester could be used. A second coat of polyester is then brushed on, though it could be sprayed, section by section, each section being the height of the tank and the width being determined by the width of the reinforcing glass-fibre fabric, which is hung from the top, something like wallpaper, and gently pressed down and downwards with the hand on to the freshly-painted surface.

The resin for this adhesive layer has a relatively low proportion of accelerator so that it shall be slow in polymerizing and drying. A third coat of resin is then applied and air bubbles removed with scraper and roller. When the whole of the tank has been covered in this way, a fourth coat of polyester is applied and care taken to see that all air bubbles are removed. The bottom of the tank is done last of all.

When dry, the tank is carefully inspected, inch by inch, with a high voltage instrument which detects holes or points of low resistance for repair. If the operations have been performed carefully, none such will be found.

For a final protection against very corrosive liquids, another resin coat and perhaps more glass-fibre can be applied. It must be remembered that it is the resin which protects, the glass-fibre being the structural element.

Back to Black

You cannot move far in either the practice or the literature of the rubber industry without encountering carbon black. In fact, some would-be wits rechristened it 'the black industry', partly because of the prevailing colour of its buildings and their denizens, and partly to suggest that most of its products consisted of carbon black bound with small proportions of rubber.

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by F. C. JENNINGS

The *Rubber World* for February 1961, Vol. 143, No. 5, is an especially rich mine of carbon black information. Even its editorial is concerned with the subject, praising the United Carbon Co. for beginning a new series of informative advertisements 'which tackle carbon black in a very basic manner and should be a big help to the chemist in orienting himself on the use of carbon black'.

This series of advertisements is entitled 'A Product in Perspective', and deals with the manufacture and properties of SRF Carbon Black in three pages of concentrated information (pp. 16-18). It should be of particular value to the student.

Black and Talc

The Sierra Talc Co. of California has experimented with mixtures of carbon black with their own talc, an ultra-fine magnesium silicate, rather fancifully called 'Mistron Vapor', in SBR rubbers. They report that 'inclusion of talc . . . greatly reduced optimum cure time while giving a good cure plateau. It also lowered Mooney viscosity, heat build up, and nerve of the compound'.

The results, given on pp. 84-5, show that two types of test mixes were prepared. One used a set total loading of black and talc with the ratio of the two varying from 60phr of black and no talc to 75phr talc and no black. 'Tensile strength and ultimate elongation were improved as talc was added and black reduced, reaching an optimum, when the amounts of black and talc were roughly equal. Additions of talc, however, generally produced poorer compression set, modulus, tear resistance, and Shore A hardness'.

The other type of mix used 45phr of black throughout and a range of talc from 10 to 50 parts. The addition of the talc in this type of compound 'gave improvement in all physical properties except ultimate elongation, which was sharply reduced'.

HAF, SAF, and ISAF blacks were all included in the tests.

How Black Reinforces

Slowly, painstakingly, research goes on to provide an answer to the question of exactly how carbon black reinforces rubbers. On pp. 73-81 of *Rubber World* for February 1961, Vol. 143, No. 5, a small but important step forward is recorded by Sweitzer, Burgess, and Lyon, of Columbian Carbon Co., under the title 'The Chemistry of Carbon Black in Rubber Reinforcement'.

They term their work a macro approach to the problem as opposed to the micro approach which has been so successful in evaluating the first two of the known factors involved in black reinforcement of rubber: particle size, structure, and surface chemistry. They have experimented with the effects on the physical properties of vulcanizates of various treatments of the carbon black, including reduction in chemisorbed surface oxygen ('devolatilization'), addition of more functional oxygen to the particle surface, and change of the underlying carbon surface by graphitization. They used two sulphur-vulcanization systems and one peroxide system.

Their main conclusions lead to the view that 'combined oxygen on the surface of carbon black plays a relatively minor role in the chemical effect of carbon black upon rubber reinforcement; the nature of the carbon surface itself plays the major role'.

Energy of Rupture

That is quite a valuable contribution to our knowledge of the subject, and, as usual in a good technical paper, there are also incidental discoveries and comments of interest. For instance, the energy of rupture (total energy under the stress/strain curve) was found to be very closely correlated with tyre wear in road tests. 'A relatively small effect is produced both upon rupture energy and road wear by devolatilization. Only when the carbon surface itself is altered (by graphitization) is a marked effect produced'. The reduced energy of rupture and the reduced road wear produced by graphitization must be attributable to physical bonding only.

'It is this combination of physical and chemical bonding', they remark, 'that distinguishes carbon black as a superior reinforcing pigment for rubber'.

Although the presence or absence of functional oxygen on the surface of the particle is of little significance to reinforcement, it does retard the rate of sulphur cure but not peroxide cure.

Black Masterbatches

The Transactions of the Institution of the Rubber Industry for February 1961, Vol. 37, No. 1, carries on pp. 1-19 a paper by Dannenberg, Hagopian, Hall, and Medalia, of Cabot Corp., called 'Carbon Black Masterbatching Processes'.

In an introduction, they point out that masterbatches made by 'adding carbon black or other compounding ingredients to latex, eliminating the water, and using the dry blend or mixture as a material for further processing is at least 40 years old', but that such masterbatches, having reached a commercial peak in 1949, declined steadily until 1957, since when they have risen again and this year will probably exceed the 1949 peak. In this paper they are concerned with the dry-mixed type of masterbatch only as a control for their work on the latex-mixed types.

The decline in the sale of such masterbatches was caused by the discovery that they produce inferior tread compounds. This inferiority was caused by the use of poor dispersions of black; the modern SBR/black masterbatches are based mainly on dispersant-free dispersions of black, and are claimed to give tread-wear improvements of 5 to 10% and more compared with dry mixing. But not all manufacturers get these good results, each plant must make comparisons under its own conditions.

These are the main, not-very-striking conclusions; such interest and value as there is in the paper resides more in the incidental work. Some dispersing agents used in making the black dispersions caused a reduction in the 300% extension modulus of the vulcanizate but 'whether dispersing agents are used or not, the quality of black masterbatch depends strongly on the methods used for the mixing and coagulating steps'. 'If the carbon black slurry is prepared without dispersing agent, the dispersion of the carbon black in the raw crumb is very poor, but, in compounding, the black agglomerates break down readily, so that excellent dispersion is obtained in the finished stock', and the properties of the vulcanizate were found to be equivalent to those of a good, dry-mixed rubber.

There is, finally, a brief discussion of the possibilities of drying the wet crumb in the Banbury to make a dried masterbatch directly.

CHARLES JENNINGS

MEN and MATTERS

A Review of People and Events

by Peter Richards

THE American National Plastics Exposition, which opens in two days time (on June 5) at the New York Coliseum, will have a distinctly international flavour about it. More than 1,200 overseas visitors are expected to join Americans in touring the 260 exhibits which are contained on three floors.

Overseas visitors will receive VIP treatment. By presenting his passport at a special registration desk, a visitor will be registered free of charge and given 'a specially beribboned identification badge'. Personally I would prefer to pay and slip in quietly.

The opening ceremony will feature an address by Dr Hugh Dryden, deputy director of the national aeronautics and space administration, on 'New Frontier for Plastics — Space'. Dr Dryden is one of the nation's foremost scientists and government spokesman for the US space programme. A specially prepared dedication message, relayed from NASA's polyester-skinned Echo satellite still in orbit around the earth, will also be heard.

Comparing The Two

A report on the Exposition will be written by our American correspondent, Norman Hewitt. It will be published in our special Interplas exhibition issue (June 17), and it will certainly be interesting to compare the two exhibitions.

Incidentally, to enable as many people as possible to see the Interplas exhibition at Olympia, which promises to be one of the biggest and most comprehensive exhibitions ever, the show will remain open until 8 p.m. on two evenings, Wednesday June 28 and Thursday June 29. (The dates of the Interplas international plastics exhibition and convention are June 21—July 1).

Flying High

Crowded roads, missed appointments, the increased tempo of business — all these factors have turned executive eyes to the business aircraft. Now it has reached the stage when 40 big companies, including biscuit makers and bankers, brewers and builders and, from our industry, Dunlop Rubber, have formed an association of business aircraft users.

Among the first things the association will look at are airport facilities for business fliers, both in the London area and in locations convenient for other cities. It will campaign for the opening — or keeping open — of suitable aerodromes and landing strips. It will also take an active interest in the Customs facilities available for business men who use their company's aircraft for overseas travel, especially in connexion with the export drive, and urge that 'the present time wasting procedures are removed'.

Angus Awards

Dr Mark Balkin, chief chemist at the oil seal division plant of George Angus and Co. Ltd., was among 42 employees from Tyneside units of the group who recently received certificates of long-service and gifts from the chairman, Colonel E. G. Angus.

L. W. Curtis, previously general manager, has been appointed a director of H. A. Smith Ltd., manufacturer of the Tenaxis and Tenaxatex ranges of adhesives and emulsions

Adhesives Chairman

A. A. Round, FIRI, assistant general manager of Dunlop's Chemical Products Division, has been re-elected chairman of the Technical Panel of the British Rubber and Resin Adhesive Manufacturers' Association.

Mr Round joined Dunlop in 1925 as an assistant in the Physics Laboratory at Fort Dunlop. He was appointed to his present post in October 1960, having been works manager of his division since 1956 and previously technical manager, Dunlop Special Products.

Faithful Servants

BTR Industries Ltd. must have an impressive record of employees with long terms of service to the company behind them as it was only three weeks ago that I reported the presentation of 50 awards at the Silvertown Rubber Co.'s factory. Another 45 employees of head office and other London establishments in the group were the guests of the company at a very pleasant ceremony at the Connaught Rooms last Friday.

These men and women, whose total service to the company amounted to over 1,300 years, were given their awards by the BTR chairman, Sir Walter Worboys. Four stalwarts with more than 40 years' service were presented with generous cheques, 16 30 year awards of gold watches were made and the other presentations, for comparative newcomers of only 20 years standing, were of BTR ties for the men and scarves for the ladies.

A number of company pensioners were also present to receive framed retirement certificates for service ranging from 50 to 26 years. If the happy atmosphere at the dinner on Friday is typical of the atmosphere in

The BTR chairman, Sir Walter Worboys *(second from right)* **chatting with three of the group's employees after presenting them with long-service awards. They are C. S. Stock, W. R. Richardson and L. F. A. Dixon and have all been with the company for 45 years.** *(See : Faithful Servants)*

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the BTR factories, as one feels it must be, then the regularity with which similar functions come round in the future is likely to increase.

The Personal Touch

This week Hytex celebrated its 15th anniversary at the Cafe Royal, London — and no one knows how to celebrate such an occasion better than this thriving rubber firm. (See pictures, opposite page).

Founded in 1946, Hytex has grown from small beginnings to a firm which now has a turnover of over half a million pounds a year — and this has been achieved in 15,000 sq. ft. of space. But, announced managing director Chris Parr at the anniversary dinner-dance, a new factory has been acquired at Shepherds Bush which will allow the company to expand. Press shops and mill rooms will remain at the present works, the warehouse and finishing department going to the new factory.

Mechanicals and hot water bottles are the main products and, Hytex being a very export conscious firm, all the bottles are exported. Recently the company gained a big contract from Holland for the supply of 50,000 hot water bottles. That the firm should be an expert in the latter field is easily understandable, since Chris Parr was with the Reliance Rubber Co. for 21 years before forming his own company, and was chairman of the British Rubber Hot Water Bottle Manufacturers' Association of the FBRAM for a number of years. Fordyce Jones, who was associated with Reliance Rubber from the early days, was the first to introduce the moulded hot water bottle into this country, and Mr Parr says that he owes a great deal to him.

At the anniversary dinner-dance it was easy to put a finger on at least one reason for Hytex's success— the personal touch. Functions can all too easily become stiff and informal. But not this one. From the lavish menu to the excellent cabaret turns, the 140 guests were not out for just another evening — they were at home with Chris and Dodie Parr.

Polly Ester Says...

'Sheet orientation — her old man pinches all the bedclothes'

THE LEGAL ANGLE

When Time's of the Essence

By a Barrister

'Semtex Ltd. . . . is now carrying out a large installation of rubber flooring at the new Manchester Courts of Justice. The contract . . . will be completed in time for the official opening of the Courts of Justice this month by HM The Queen'. RPW May 6 1961.

Doing a job for justice? Very nice. But there is obviously a time limit. We presume that the job was finished well on time, but suppose it had not been completed by the day of the proposed opening? What happens if *your* contracts are not completed on time? Can the purchaser refuse to accept your goods if they are delivered late? Can they sue you for damages? Also, what if the delay is entirely due to causes beyond your control: such as illness of your staff, incompetence of a sub-contractor or an unanticipated breakdown in your machinery?

In every case, the answer all depends on whether or not time was an essential element of the contract concerned. And whether or not time was — in legal jargon — 'of the essence', depends upon the terms of the contract concerned.

If nothing is said about time for completion then a term will be implied into the contract that the job will be done within a 'reasonable time' — such time, that is, as is reasonable, having regard to all the circumstances of the case. Equally, if you promise to complete a job by a certain date 'if you possibly can' — or if you say you will do it by 'about the 15th of the month' — then time clearly is not 'of the essence'. And even if you do not reach any set date, you will still have a reasonable time thereafter to complete the work.

But on the other hand, where it is a date that is fixed, and you know that the other party requires the work to be completed for a specially urgent reason by that date, time will clearly be 'of the essence'. For instance, Semtex knew that it was quite essential that the rubber flooring for the Law Courts should be completed by the date when Her Majesty opened the place. Time was obviously 'of the essence' in that contract.

So the first question is answered, as usual, by reference to the particular contract. You must look to see whether time is an essential element of it.

Let us now suppose that time is 'of the essence' — and you are late. The fact that this is due to 'causes beyond your control' will seldom help you. You must allow for contingencies when quoting for a job. If your staff are ill, your subcontractors incompetent or your machinery inefficient — that is your misfortune. Your contractual arrangement is with your purchaser, and he is entitled to look to you to complete the job on time.

'But what if you apologize for being late and ask for and are granted an extension; does time cease to be "of the essence"?'

Yes, it does. The other party has waived his right to require you to complete by the set date. But the Courts have held that the term as to time can be re-introduced, by setting another date for completion, and giving reasonable notice of this new date to the other party.

'And what will happen if we do not complete by the agreed date, when time is of the essence?'

Then you have repudiated your contract. The other contracting party is entitled to accept that repudiation, regard the whole deal as off — and to sue you for damages for any loss which was a direct and forseeable result of your breach of contract.

'But we would be caught with all the goods he had ordered . . .'

Unfortunate, but you should keep to the terms of your contract.

'But suppose we could induce the other party to go ahead . . .'

Then you would be lucky. But you might still find yourself having to pay damages, if it could be proved that your delay had caused financial loss.

So you see that the old phrase, 'Better late than never' has its limitations. There are many times, in contract law, when 'late' and 'never' come to the same thing.

News from South Africa

No Tyre Import Duty

TRADING PROBLEMS REVIEWED IN DUNLOP SA REPORT

THE chairman of Dunlop South Africa Ltd., stated in his review for 1960 that the Board of Trade and Industries declined to support the industry's request for a higher import duty on tyres, although the quantity of imported tyres had been increasing. Export sales had to be curtailed for reasons 'beyond the company's control'. The South African tyre manufacturers had recently introduced a new trading policy which 'should restore stable trading within the industry'.

The cost of rubber used in manufacture was considerably higher than in the previous year. 'In this connexion it should be noted that the price increases approved by the Government and effective from the beginning of the year were related to costs ruling in the latter part of 1959. They did not, therefore, compensate for the higher material prices that were encountered later in 1960.

'Again, due to the sharp fall in rubber prices in the last quarter, it was necessary to write down the value of the year-end inventories to the lower market prices then ruling. As a result of a considerable amount of foreign capital being withdrawn in 1960, with an unfavourable effect on the Exchange Reserves position, a tighter application of import control was introduced by the Government towards the year-end. Since many factories in the country have been working below capacity, the impact of the restrictions at the level now contemplated should not, of itself, be harmful to the economy as a whole. One resultant aspect likely to affect the company, however, is that car assembly levels may be lower in 1961'.

Goodyear Sales Increase

Goodyear Tyre and Rubber Co. (S.A.) Ltd. reported that in 1960 sales increased by about 4%. During the first quarter there was a marked improvement in volume over 1959, but sales slackened in the last half of the year in line with the trend of the national economy. The net profit of 370,242 was 20% higher, despite a substantial rise in the cost of natural rubber. The 20% ordinary dividend took £260,000. So far £328,525 of the 750,000 £1 5% preference shares have been redeemed. The profits carried forward amounted to £2,451,936, compared with £2,389,726 in the previous year.

Testing Polythene Liners

The South African Bureau of Standards recently undertook tests in its Pretoria laboratories to determine the amount of punishment that could be inflicted on polythene liners. The test was on inner polythene drums with countersunk screw cap closures. They were first tested separately by internal air pressure of leaks at seams and closures.

In the next test they were put into 45-gallon steel drums and filled to within 98% of total capacity. The closed drums were vibrated at 250 cycles a minute on each end and at the sides, and after the liners had been inspected they were dropped six times diagonally from a height of 3ft. This dented the steel drums seriously but the liners still effectively retained their contents. They followed the shape of the indented drums and reverted to the original shape when removed.

Hytex Celebrates Its Fifteenth Anniversary

(*See opposite page — The Personal Touch*)

Some of the guests at the highly entertaining Hytex dinner-dance (*left to right*). **1. Mrs S. Covell, Mrs Dodie Parr, Chris Parr (Hytex managing director), Peggy Mercier and Stuart Covell (director, Federation of British Rubber and Allied Manufacturers). 2. L. Greenwood (Empire Rubber) and Mrs Greenwood. 3. Mrs Marshall and H. W. Marshall (Marshall and Sons Ltd.). 4. A. J. Burnley, Mrs Burnley and C. P. Davis (Ford Motor Co.). 5. N. Hillson (Tyre Products), Mrs Rapazzini, J. Hillson, Mrs G. Brown, A. D. Rapazzini and Mrs Hillson. 6. J. B. Morgan (Wilfrid Smith Ltd.) and Mrs Morgan**

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Rubber Workshop Practice

CITY AND GUILDS EXAMINATION PAPERS AND EXAMINERS' REPORT FOR 1960

THE relatively new City and Guilds examination in Rubber Workshop Practice has disclosed a greater demand than was expected for training at this level. Great interest has been expressed in this examination by members of the rubber industry and the papers for the 1960 examinations are printed below together with a brief report by the examiners on the attainments of the candidates. The examination was divided into two sections, each consisting of a written and a practical paper. Three hours were allowed for each written part, and six hours for each practical paper.

Section 1 — Written

Part A

Brief answers (one or two sentences) were required for the questions in this part.

1. (*a*) What is meant by 'sulphur bloom'? (*b*) How is it caused?

2. A press cure is carried out at 153°C. What is this in degrees Fahrenheit? (Show your calculation.)

3. In a fabric, what is: (*a*) the warp, (*b*) the weft, (*c*) the selvedge.

4. What is the purpose of using steam traps in vulcanizing equipment?

5. (*a*) Explain what you understand by the specific gravity of a rubber compound. (*b*) How must specific gravity be borne in mind in fixing the price of a finished article?

6. Why is zinc stearate sometimes used as a dusting agent in preference to French chalk?

7. What is meant by a high-modulus rubber compound?

8. If a cubic foot of a rubber compound weighs 85lb., what is its specific gravity? (Density of water = 62.5lb./cu. ft.)

9. What is meant by the following, as applied to steam: (*a*) sensible heat, (*b*) latent heat.

10. (*a*) Why are white metal moulds sometimes used instead of steel moulds? (*b*) Why are brass moulds never used?

11. What is meant by an 'open steam' cure?

12. (*a*) How does the plasticity of unvulcanized rubber depend on the degree of mastication? (*b*) Name *two* manufacturing processes in which a high degree of plasticity of the uncured stock is very important.

13. Calculate the volume of: (*a*) a cylindrical rubber block of length 5in. and diameter 2in., (*b*) a ball 3in. in diameter.

14. (*a*) The ram of a hydraulic press has a diameter of 8in. If the line pressure is 0.75 tons/sq. in., what is the total force exerted? (*b*) What pressure would be exerted on a rectangular mould 12in. × 9in., in the press referred to in (*a*) above?

Part B

Candidates were asked to answer four questions.

1. Write an account of the uses of *each* of the following in the rubber industry: (*a*) zinc oxide, (*b*) pine tar, (*c*) organic accelerators.

2. Describe the extrusion process. State the various applications of the extruding machine in the rubber industry.

3. What main grades of plantation rubber are commercially available? Indicate the uses of each. What are the advantages of plantation rubber compared with other types of natural rubber?

4. Describe *one* method for the manufacture of reclaim. Why is reclaim used in rubber compounds?

5. How is mastication carried out in the factory? What are the reasons for masticating rubber?

6. Describe the production of single texture proofed fabric for use in the manufacture of rainwear.

Part C

Candidates were asked to answer one of the questions.

7. Draw a graph to show the following relationship between the diameter and volume of a sphere: Diameter (in in.): 1, 1½, 2, 2½, 3, 3½, 4, 4½, 5. Volume (cu. in.): 0.5, 1.8, 4.2, 8.2, 14.1, 24.4, 33.5, 47.7, 65.3. Determine from the graph: (*a*) the volume of a sphere with a diameter of 1.75 in., (*b*) the diameter of a sphere with a volume of 30 cu. in.

8. A compound has a specific gravity of 1.40. To 100lb. of this is added 5lb. of zinc oxide (sp. gr. = 5.55). Calculate the new specific gravity of the compound.

Section 1 — Practical

Each candidate was required to attempt two questions in one part, which was selected by the examiner-in-charge.

Part A

1. Weigh out and mix a compound to the following formulation:

smoked sheet	250	grams
reclaim	140	„
brown factice	20	„
whiting	120	„
stearic acid	4	„
zinc oxide	6	„
sulphur	8	„
MBT	3	„
antioxidant	3	„

Determine the specific gravity of the completed compound.

2. You are provided with uncured compound, A2. Calender this into a sheet $\frac{1}{16}$in. thick. Ply this up on a table to give a sheet $\frac{1}{4}$in. thick. From this, build a hollow ball, using the template provided, and prepare for curing. (The ball requires both pellets of the inflating agent with which you are supplied.)

Submit the uncured ball to the examiner.

Part B

3. Weigh out, and mix, about 300 grams of a compound to the following formulation:

pale crepe	100	parts by weight
stearic acid	1	„ „ „
zinc oxide	5	„ „ „
sulphur	3	„ „ „
MBT	1	„ „ „
antioxidant	1	„ „ „
titanium dioxide	10	„ „ „
mineral oil	2	„ „ „
china clay	80	„ „ „

Take one quarter of this white base mix and add 2% by weight of the red pigment supplied. Use the two compounds to make a marbled table mat. A suitable cure is 30 minutes at 40psi. Submit the finished product to the examiner.

4. You are given a finished rubber moulding, B4/1, and an uncured compound B4/2. Prepare from this compound a suitable blank for large-scale production of the moulding. Submit the blank to the examiner.

Part C

5. Weigh out 250gm. of the uncured compound C5. Add to this all of the following ingredients:

60% by weight of china clay
2% „ „ „ mineral oil
2.5% „ „ „ carbon black

Press cure a sample of this for 30 minutes at 40psi and determine its specific gravity.

6. You are required to produce a 2ft. length of two-ply reinforced hose on the mandrel supplied. Extrude the compound C6/1 to a bore suitable for use as the hose lining, and of wall thickness $\frac{1}{16}$in. Complete the building up with the frictioned hose duck and the cover compound, C6/2, both of which are supplied. (The cover compound should be sheeted out to a thickness of $\frac{1}{16}$in.)

Prepare the hose for curing, and submit it to the examiner.

Section 2 — Written

Part A

Short (one- or two-sentence) answers were required.

1. Name *two* products which are made from heavily masticated rubber.

2. Give the approximate amounts of sulphur, based on 100lb. natural rubber in each case, used in the manufacture of (*a*) tyre treads, (*b*) ebonite rods.

3. For what purposes in the rubber industry, is fabric cut on the bias?

4. (*a*) How is rayon fabric pretreated before calendering? (*b*) Why is the pretreatment necessary?

5. For what main technological contribution to the rubber industry is *each* of the following famous: J. B. Dunlop, B. Chaffee, R. W. Lunn?

6. How is blistering avoided during spreading?

7. What use is made of activated carbon in the rubber industry?

8. Give *one* example of the use of *each* of the following in the manufacture of hollow articles: (*a*) air, (*b*) nitrogen.

9. A finished moulding weighs 30oz. The blank used weighed 32.75oz. What percentage scrap has been formed? By how much must the original blank weight be reduced to give a scrap figure of 4%?

10. What is meant by 'stability' as applied to latex?

11. What classes of operatives are not allowed to clean moving machinery?

12. Name *one* recent important development that has taken place in the manufacture of rubber footwear.

13. Sketch a vulcanizing pan, showing clearly the position of (*a*) steam main, (*b*) reducing valve, (*c*) steam inlet valve, (*d*) steam trap *and* (*e*) exhaust.

14. The drawing in Fig. 1 shows the plan of the lower portion of a simple mould for manufacture of a solid rubber play ring of circular cross section, drawn to quarter scale. In the space provided (*a*) draw a cross section at A A *and* (*b*) indicate, using conventional signs, the internal and external diameters.

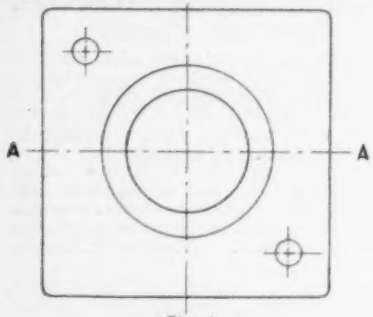


Fig. 1

15. A dumb-bell test piece has the following dimensions: thickness 0.12in., width of narrow part 0.25in., distance between reference lines 1in. The load at break is 70lb., when the distance between the reference lines is 5in. Calculate: (*a*) the tensile strength, (*b*) the elongation at break.

Part B

Candidates were asked to answer five questions.

1. Describe the manufacture of a conventional motor car tyre.

2. What types of rubber hose (wrapped or braided) are commercially available? Describe in detail the industrial manufacture of wrapped hose.

3. Give the reasons for the use of each of the following in *synthetic* rubber compounds: (*a*) zinc oxide, (*b*) reinforcing furnace blacks, (*c*) finely divided silicas (*d*) calcined magnesia, (*e*) dioctyl phthalate (DOP).

4. Describe the laboratory preparation of sponge rubber from *either* (*a*) dry rubber *or* (*b*) latex, indicating the type of formulation you would use.

5. What advantages has latex over rubber solutions for the manufacture of dipped articles such as toy balloons? Describe in detail the manufacture of any *one* type of dipped article starting from 60% ammonia preserved concentrated latex.

6. Compare the processing behaviour and the applications of butyl and natural rubber.

7. Name a suitable solvent for use with *each* of the following unvulcanized rubbers: (*i*) natural rubber, (*ii*) butyl, (*iii*) neoprene, (*iv*) SBR, (*v*) nitrile.

What precautions must be taken in the storage and use of each of these solvents in relation to (*a*) toxicity, *and* (*b*) fire hazards?

8. Describe the basic feature in the design of (*a*) a two roll mill, *and* (*b*) an internal mixer. Compare the advantages and disadvantages in the use of each type of mixer.

Section 2 — Practical

1. Mix a Neoprene compound to the following formulation:

neoprene GNA	100
zinc oxide	5
calcined magnesia ..	4
tritolyl phosphate	20
whiting	50
antioxidant	1

Cure test slabs from this compound for 20, 25 and 30 minutes at 60psi. Determine which cure gives (*a*) maximum tensile strength, (*b*) maximum hardness.

You are also provided with uncured calendered neoprene sheet, made to the above formulation. Use this to build a 10in. length of two-ply tube on the 1in. diameter metal mandrel supplied. Prepare this tube for curing, and submit it to the examiner.

2. Compound 300g. of the 60% natural rubber latex supplied, to the following formulation:

rubber	100 dry weight
zinc oxide	5 „ „
sulphur	1½ „ „
ZDC (accelerator) ..	1½ „ „
china clay	200 „ „
antioxidant ..	1 „ „

Use the completed latex mix to cast a hollow rubber toy in the plaster mould provided. Cure in the wet condition for one hour at 95°C., and submit the product to the examiner.

EXAMINERS' REPORT

SECTION 1

Year	Number of Candidates	First Class	Second Class	Fail	% of Passes
1958	22	10	9	3	86.4
1959	30	18	7	5	83.3
1960	45	21	15	9	80.0

SECTION 2

Year	Number of Candidates	First Class	Second Class	Fail	% of Passes
1958	15	11	4	—	100.0
1959	18	10	7	1	94.4
1960	26	5	19	2	92.3

Section 1

Written

There was a wider spread than usual in the abilities of this year's candidates: a number of scripts were very good indeed, but there was a larger proportion than usual of very mediocre papers.

Part A

The answers to the series of short questions were in general better than those for the remainder of the paper. Some candidates seem in doubt as to the length of answers required in this section. It might with advantage be pointed out to them that the number of lines allotted to each question indicates the amount of writing expected.

Part B

Question 1. This was not answered well, many answers being much too vague.

Question 2. A very popular question, with some very good answers.

Question 3. This was attempted by only 11 candidates, of whom only two scored more than half marks.

Question 4. Well answered by most candidates who attempted it. It is evident that at all centres reclaiming has been dealt with adequately.

Question 5. Another popular question, with a very ' mixed bag ' of answers.

Question 6. Quite good answers from most who attempted it.

Part C

Both questions were equally popular, and with few exceptions candidates scored well. It is interesting to note that this is the first time so many candidates have been prepared to tackle the question on graphs, and to show they can use them properly.

Practical

The standard of work was high and showed a good grasp of the fundamentals of processing.

There is still a tendency on the part of many students to take much too long over their mixings. Under examination conditions this is perhaps understandable, but Colleges should continue to stress this point. Lack of cleanliness during working was again in evidence with a number of otherwise good practical candidates: examples noted this year include use of unclean surfaces for mixed compounds, production of beautifully grey 'white' mixes for marbling, use of dirty moulds and plates. Fortunately this is not a general criticism. Preparation of blanks for moulding was in too many cases haphazard. Specific gravity determinations provided no difficulties. The cutting of frictioned fabric on the bias and joining up for making a hose caused considerable difficulty: even those who cut on the bias were very unsure of how to join it.

Section 2

Written

The general standard of answers was below that of last year and there were no outstanding scripts.

Part A

This was adequately answered. The poorest answers were given to question 14 (engineering drawing) and question 9 (calculation of scrap).

Part B

Question 1. With one exception, answers were poor and inaccurate.

Question 2. Moderately well answered by those who attempted it.

Question 3. A popular question, well answered.

Question 4. Most candidates attempted this, but the quality of the answers varied considerably.

Question 5. This was a straightforward question, but whether it was attempted, and the quality of the answers, seemed to depend on the particular centre.

Question 6. Not well answered.

Question 7. This was the least popular question, but those who attempted it gave quite good answers.

Question 8. The most popular question, most candidates scoring well.

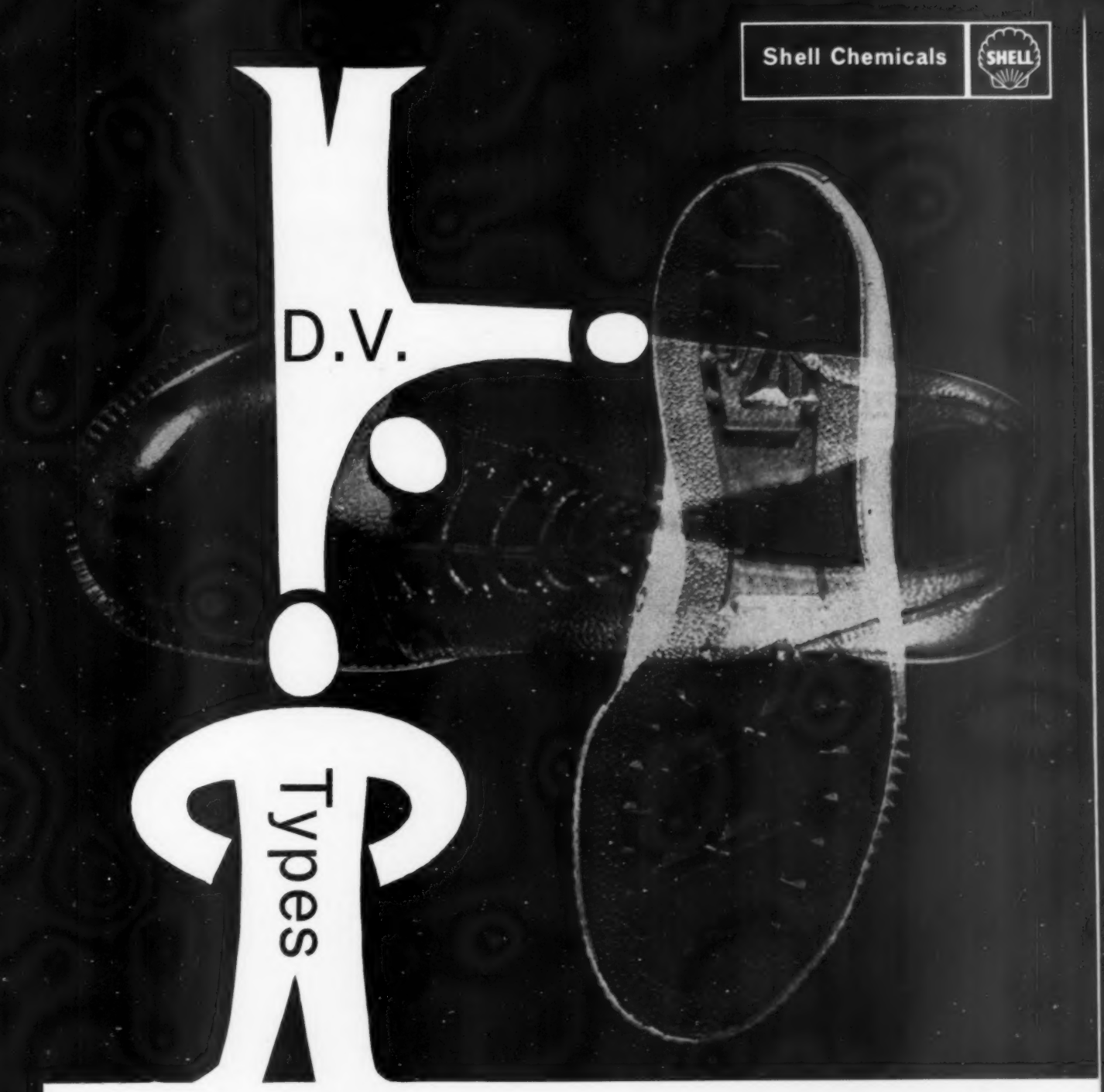
Practical

In general, a reasonable competency was displayed by candidates. It is difficult to make general comments, due to the wide variation in practical experience of the students, but the following observations may be of value.

As in Section 1, there is still a tendency to take too long over mixings and, in a few cases, not enough attention to tidiness and cleanliness. Tensile strength and hardness measurements presented little trouble, and the impression gained is that most candidates really know what they are doing. The construction of a two-ply tube led to some very varied results. In the latex question, all candidates were able to calculate correctly the amounts of dispersions required. The general technique for incorporating clay and subsequent casting was obviously known but, as might be expected, this was carried out with widely differing degrees of success.

The examiners were H. C. Guthrie, D. W. Hinton and L. L. Roe.

Shell Chemicals



Direct vulcanisation: the process that moulds the sole directly to the upper, firmly, without stitching. The process that is at its most effective with 'Cariflex' Rubbers . . . in particular, S-1509, S-1707, S-1009 and SP-103. These, together with the new 'Cariflex' Isoprene Rubbers, are particularly suited to the 'D.V.' process (known also as the 'moulded on' process). 'Cariflex' offers quick cycles, fast, safe cures, robust adhesion, excellent mould flow, ease of colouring — every quality, in fact, that makes for speedy, economic mass production. Shell have evolved suitable formulations in Europe and America in co-operation with major manufacturers of footwear machinery. Shell's experience in 'direct vulcanisation' techniques is at your service.

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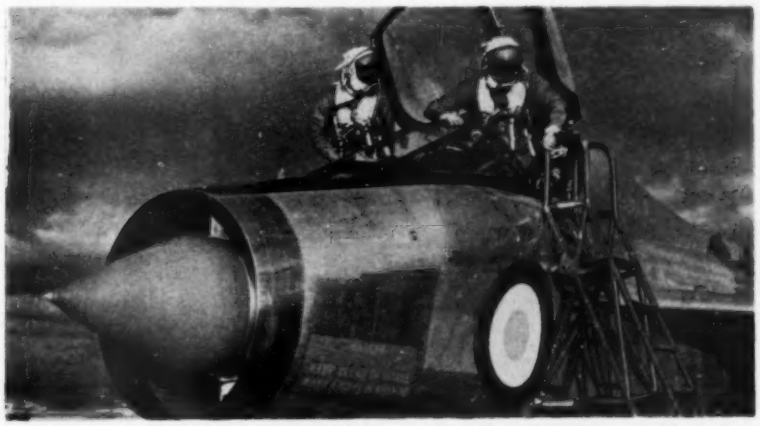
THREE-DIMENSIONALLY CONTOURED SHAPES

THE Radome on the English Electric Lightning fighter, the first supersonic military aircraft to go into service with the Royal Air Force, has been the cause of much exhaustive research.

It is necessary to produce the radome to very close dimensional tolerances, and with correct dielectric constant and since there are 42 layers of glass cloth in the moulding, the hand lay-up technique would have been extremely expensive and very difficult to control to the necessary quality.



The glass-reinforced polyester radome of the English Electric Lightning is made using 3-D contour-woven glass shapes. This makes production to close tolerances and correct electrical properties more rapid and accurate

After some unsatisfactory trial and error research employing conventional lay-up methods, the reinforced plastics division of English Electric fabricated prototype radomes using three-dimensional woven shapes which proved satisfactory and are being used on the production aircraft. The use of these woven socks ensures accurate and rapid production and the tolerances on the final product are ± .004in., while the glass content is 65% ± 2½%. Working to these close tolerances is necessary to maintain the electrical properties over the whole surface.

Three dimensional weaving makes it possible to reproduce exactly a predetermined shape in cloth without seams or irregularities and their resultant loss in strength. This process is operated under exclusive licence in the UK by Fothergill and Harvey Ltd., Littleborough. In weaving these shapes, the end product is controlled automatically by a punched card system, stations are laid off at convenient intervals on the shape surface and the circumference computed at each interval. A specially designed cam is used to control the warp so that the dimensions in this direction can be exactly maintained.

The system is flexible and the cloth construction can be varied within certain limits. For example, extra warp yarns and a heavier weft can be introduced to build up an area suitable for attachment purposes on the finished component. Similarly fabrics of progressively changing thickness can be woven should a diminishing wall thickness be required in the component.

The system is not confined to the production of conical shapes. Any shape with changing configuration can be woven with complete accuracy including non-symmetrical shapes.

Nuclear Filters

Vyon porous high density polythene is being used in the form of filter candles at nuclear power stations in the UK.

At one stage in the process uranium rods are taken to a chemical separation plant, where they are dissolved in acid to enable the plutonium fission products and uranium to be separated by solvent extraction.

Filtration of active chemicals is a particularly exacting task for any equipment and it is essential to employ a material which is mechanically strong, chemically inert and has a large volume flow with a low pressure drop. For this purpose porous polythene filter candles have been supplied by Porous Plastics Ltd. to protect pump valve packs and other equipment in the liquid chemical feed lines.

New Polyesters

BIP USE ISOPHTHALIC ACID

WORK carried out in USA has shown that polyester resins in which isophthalic acid is used instead of phthalic anhydride have some improved properties. In particular, the speed at which the resins wet glass fibre reinforcement is increased and moulded articles display greater flexibility. These features are expected to be of particular interest for applications such as the production of car bodies and commercial vehicle panels. The increased flexibility reduces the likelihood of damage being caused by flying stones and minor collisions and the tendency to cracking and crazing on flexing is minimized. The improved reinforcement wetting is also of obvious advantage in improving the properties of the final product and allowing more streamlined methods of manufacture — making possible a good quality moulding at a reasonable price.

Two New Types

British Industrial Plastics Ltd. has just added to their range of Beetle polyester resins two isophthalic acid types. These are known as Beetle L2601 and L2051, the former being recommended for hand lay up purposes and the latter for gel coating.

One disadvantage of these new resin types is that the chemical resistance of gel coats formed from them is not quite as good as those formed from more rigid resins and they should not therefore be used for applications where chemical resistance is of primary importance.

Part of 500 tons of conveyor belting for Russia being prepared for press vulcanization at the Dunlop Belting Division, Speke, Liverpool. Covered with special abrasion-resistant rubber compound for currying ferrous and non-ferrous ores, the 6½ miles of belting has an average width of 79½in. and is approximately 1¼in. thick. The fabric has up to 14 plies of Terylene and has a nylon wrap-round cover

Rubber Statistics

UNITED KINGDOM — UNITED STATES — FRANCE — NIGERIA

IMPORTS of all rubber into the UK during April amounted to 28,985 tons, according to figures issued by the Board of Trade. Exports totalled 5,748 tons. Details are given below.

IMPORTS

	April 1961	April 1960
Nigeria	1,637	2,029
Singapore	5,052	3,749
Federation of Malaya	11,704	8,094
Ceylon	657	678
British North Borneo	226	184
Canada	1,931	2,264
Other Commonwealth Countries and Irish Republic	201	135
Vietnam	1,121	175
Indonesia	1,545	1,072
USA	1,353	4,067
Other foreign countries	3,558	1,542
Total	28,985	23,989
Rubber latex	1,656	1,662
Other raw, including crepe	23,328	14,555
Balata	24	23
Synthetic rubber	3,042	5,590
Others	935	2,159
Total	28,985	23,989

EXPORTS

Commonwealth countries and Irish Republic	1,659	1,335
West Germany	678	506
Spain	497	671
Netherlands	187	394
Other foreign countries	2,727	2,409
Total	5,748	5,315
Synthetic and reclaimed rubber	3,462	2,437
Waste rubber	2,286	2,878
Total	5,748	5,315

United States

The US Rubber Manufacturers' Association has announced the following details of tyre production and exports for March:

Production:	
Motor car tyres	8,196,000
Truck and bus tyres	1,016,000
Motor, cycle, truck and bus inner tubes	3,359,000
Consignments:	
Motor car tyres	8,082,000
Truck and bus tyres	1,084,000
Inner tubes	3,588,000
Exports:	
Motor car tyres	72,000
Truck and bus tyres	52,000
Inner tubes	61,000
Domestic shipments:	
Car tyres (original equipment)	2,134,000
Car tyres (replacements)	5,876,000
Truck and bus tyres (original equipment)	313,000
Truck and bus tyres (replacements)	719,000

The United States Rubber Manufacturers' Association reports that total consumption of new rubber in April amounted to 115,660 tons against 120,916 tons in March.

Consumption in April comprised 33,005 tons of natural rubber and 82,655 tons of synthetic (including 68,005 tons of SBR). March consumption comprised 34,908 tons of natural and 86,008 tons of synthetic (including 71,110 tons of SBR).

Total synthetic rubber production in April was 108,420 tons against 112,580 tons in March, while production of SBR was 87,709 tons compared with 89,779 tons. Total synthetic rubber exports in April were 22,965 tons against 27,693 tons in March.

France

Imports of tyres into France in February increased to 863 tons from 728 tons in January, and exports rose by three tons to 4,629 tons. This brings total imports in the first two months to 1,589 tons compared to 1,128 tons in the same period in 1960 while exports amounted to 9,252 tons against 11,320 tons.

Industrial rubber production in March is estimated at 18,990 tons, a slight rise over estimates for February of 18,010 tons. The final figure for January production was 19,000 tons. This brings estimated production for the first three months of this year to 56,000 tons compared with 56,025 tons produced in the first three months of 1960.

French tyre production in March is estimated at 23,000 tons compared with 22,750 in February and 22,820 in January this year. This brought the total for the first three months of the year to 68,570 compared with 67,675 in the same period in 1960.

Nigeria

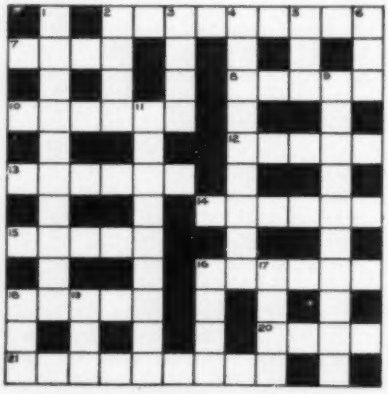
The price of rubber for the month of May 1961 for the purpose of assessing values of export duties is 24.99d. per lb. against 23.75d. for April. This compares with 34.11d. and 33.02d. respectively in 1960.

Cable Contract for BICC

British Insulated Callender's Cables Ltd. has been awarded a contract by the Central Electricity Generating Board for the supply and installation of 132,000-volt underground cables in the London area. The contract, valued at approximately £1¾m., will provide a major power link between the CEGB Terminal Tower at Lessness, Belvedere, and their substation at Wimbledon. The cable route length is about 19 miles, work will commence early this summer and is due for completion in September 1962.

The installation will comprise two circuits, each of three single-core oil-filled cables with 0.75 sq. in. copper conductors. Control and communication cables will be installed adjacent to the main power cables which will provide a power link-up with two other 132,000-volt oil-filled cable installations which BICC already have in hand for the CEGB, between Kingston and Wimbledon and Kingston and Chessington.

RPW CROSSWORD



CROSSWORD No. 78

CLUES ACROSS

2.—A lubricant is moulded first (6, 3).
7.—Lies around Skye for example.
8.—A notion first and exactly right.
10.—A group of islands.
12.—Lewis Carroll's heroine.
13.—Greet the musical instrument finally.
14.—Small.
15.—An open inner court.
16.—The Golden Tire Co. is complete inside.
18.—Eats again. Oh sound an abbreviated organization.
20.—Another star university faculty.
21.—Yes, in the middle of a material which combines with 1 down to form a polyurethane.

CLUES DOWN

1.—See 21 across.
2.—Closed or open in expanded rubber.
3.—Remain.
4.—PBN for example is used to prevent this in rubbers.
5.—A raw material or a point.
6.—Abner is a little short.
9.—Increase the rate of cure.
11.—White pigment for rubber.
16.—A way out.
17.—This strength is important in rubbers.
18.—Support but not the left side.
19.—Call finally for everything.

(Solution appears on page 854)

BEHIND THE DUNLOP SYMBOL

When he experimented with the materials he had bought at a local chemist's shop, John Boyd Dunlop worked with a purpose . . . to make a practical pneumatic tyre for his son Johnny.
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DUNLOP SYMBOL OF PROGRESS

cm/rwa/23

Plantation Newsletter

by our Malayan Correspondent

MICROSCOPIC RESEARCH ON RAW LATEX

FROM KUALA LUMPER

LATEX from the tree is not one but a whole range of substances, and at least eight are mentioned in an article by Dr R. W. Southorn of the Rubber Research Institute of Malaya.

This is a reminder that claims to have synthesized natural rubber latex may not be all they seem, as the exact structure of this complex substance is only slowly yielding its secrets to analysis under the electron microscope.

The article describes the results of recent microscopic research at the RRI on raw latex as it comes from the tree. Among the particles which are being studied are microscopic pear-shaped vessels known as lutoids which have been found to contain a substance — 'B' serum — which, it is believed, is different in content from the surrounding medium in which the particles float.

'This is of potential technological interest for several reasons', according to the article. 'For example, processes which break the lutoids will release active components which are otherwise imprisoned within the lutoid membranes'.

Meanwhile, it was announced this week that C. G. Akhurst, deputy director of the RRI, leaves on retirement in October. The RRI is now looking here and in Britain for a man with the right qualifications to fill Mr Akhurst's post.

He will be expected to assist the director, Dr C. C. Webster, in the administration of the RRI, particularly with the preparation of research programmes and the co-ordination of the work of the biological divisions. His duties will include stimulating and co-ordinating research in the fields of plant physiology and biochemistry.

Applicants should preferably be under 45, be science graduates with considerable research experience and have administrative ability.

The terms offered: $2,900 basic salary, $100 cost of living allowance for a Malayan. For an overseas man, the same salary with $100 cost of living allowance plus $350 overseas allowance and $100 for each child (maximum three children) up to the age of 18 years. In addition, rent free furnished quarters or housing allowance and medical attention will be provided.

UN Commodity Fund

The United Nations proposes to set up a development insurance fund for primary producing countries which could help Malaya in the event of a slump in either rubber or tin.

Mr Liew Sip Hon, controller of the export commodities division of the Ministry of Commerce and Industry, announced this following his return from the UN-sponsored Commission on International Commodity Trade held in New York. He said the proposal was still in the study stage and would be given greater consideration at the next meeting in Rome next year.

The idea is to allow primary producing countries to be able to draw sums from a central fund to offset the fall in export earnings should there be a slump in a commodity like natural rubber, which would seriously harm the economy of Malaya.

Mr Liew said he had learned from American sources that unless Malaya could maintain the price of rubber between 70 and 75 cents per lb., it would find it difficult to compete with synthetic rubbers.

Payments for the Seventh Day

Representatives of estate workers and employers will start negotiations towards the end of July on proposed variations now in force regarding wages and other conditions.

This was agreed to here following a meeting of representatives of the Malayan Planting Industries Employers' Association and the National Union of Plantation Workers.

It is understood that the negotiations will centre round the proposals by the union for variations of the agreement which has been in force since June 1 1959. Particular attention will be given to that part of the agreement concerning holidays and seventh day (rest day) payments.

Under the agreement, workers are paid overtime if they work on the seventh day after six consecutive days of work. The Government, however, recently proposed an amendment to the Employment Ordinance to the effect that, in a calendar week, any worker working seven days must be paid time and a half for the seventh day.

This may prove disadvantageous to the estate worker as, under the present agreement, he is allowed to work for any six consecutive days to qualify for overtime.

It is presumed that ways and means will be found to adjust the agreement so that there will be no disadvantage to the estate worker.

Slowing Down

Adolph Monsaroff, of Monsanto Canada Ltd., Montreal, president of the Society of the Plastics Industry (Canada) Inc., told the 19th annual convention of the organization at Niagara Falls that the Canadian plastics industry kept growing last year — but not as fast as in earlier years.

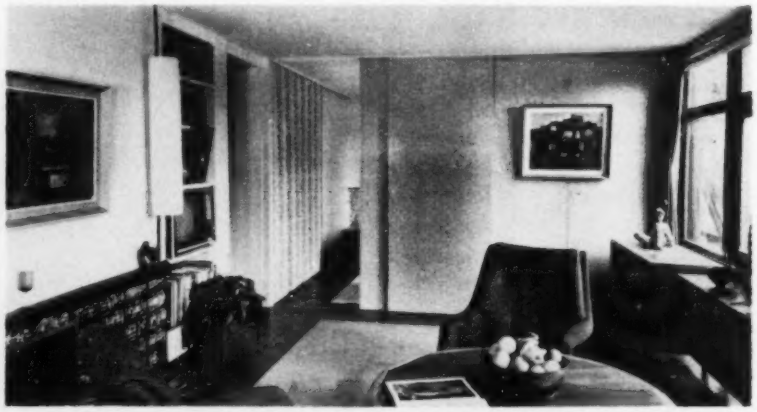
Mr Monsaroff said that Canadian sales in 1960 were about $288m. This was a 5% increase over 1959, which, in turn, showed a 10% increase over 1958.

Mr Monsaroff said that while the picture is still bright, members should not be complacent. 'Primarily, we must be concerned with low profitability and the effects of imports on prices and, therefore, our share of the market', he declared.

Imports for 1960 totalled $100m. or 42% of domestic production, said Mr Monsaroff. For secondary manufactured plastics, imports rose to 66% of Canadian output in relation to only 61% in 1959.

In primary plastics materials the comparable figure remained steady, at 40% for both years.

Mr Monsaroff said that while exports were also substantial — about $40m. — much of this total was not desirable business as profit margins were low.



The 'Ideal Home' house of the year at Hampton was officially opened recently. Extensive use has been made of Formica laminates on all interior partition walls — all of which are removable

Industry INTELLIGENCE

Technical Data

Vybak VB 243

A new grade of semi-rigid pvc sheet has been developed by Bakelite Ltd., 12-18, Grosvenor Gardens, London, S.W.1. This is Vybak VB 243 and it has been specifically designed for all types of clicking and cutting machines in use in the footwear, paper and clothing trades, where a robust hard wearing cutting pad material is necessary.

Pads made from VB243 are claimed to bed in quickly and to facilitate single or multiple clicking of leather, rubber, rigid and flexible plastics, paper, coated fabrics and other similar materials. The material is non-flammable and possesses good resistance to chemicals including petrol, paraffin and denatured alcohol but is affected by some organic acid esters, ketones and chlorinated and aromatic hydrocarbons.

Vybak VB 243 pads are distributed by Northampton Industrial Supplies Ltd., Balfour Road, Northampton.

Pigments for UF and PF

Technical information pamphlets Nos. 604 and 605 have been issued by the Dyestuffs Division of I.C.I. The first deals with colours for phenol formaldehyde moulding powders and a list is given of colouring matters which have been selected from extensive ranges of products tested, and claimed to have the best technical performance as well as giving pleasing shades under laboratory conditions of test.

The second pamphlet gives information on pigments for urea-formaldehyde moulding powders. The performance of pigments for colouring the powders has been assessed by adding them to standard types of alpha-cellulose-filled and wood-filled urea-formaldehyde moulding powder bases containing normal lubricants and accelerators, and carrying out moulding trials at 280°F. on moulding powders prepared in the normal way. Colour fastness has then been determined by a method described in the pamphlet.

Phosgard Flame Retardants

A range of organo phosphorous compounds has been developed by Monsanto Chemicals Ltd., Victoria Street, London, S.W.1. These flame retardants, sold under the name Phosgard, combine the attributes of high halogen and phosphorous content and excellent compatability with a wide range of polymeric systems to yield a new family of useful additives to plastics, textiles and paper. Because of their low colour, the Phosgard compounds may be used with clear and light-coloured plastics and films to give flame retardance without effect on the appearance of the product.

Phosgard compounds can be produced with various molecular weights and combinations of halogens. The excellent solubility of these products permits easy incorporation in polymer melts and solutions or on the roll mill.

The low acidity and excellent hydrolytic stability of the Phosgard 'R' series suggest their use in applications where flame retardance with maintenance of superior electrical properties is desired. They have been found effective in reducing flammability in a variety of polymer systems. Concentrations of 3-25% by weight bring about marked reductions in flammability as determined by standard tests. They are of a low order of toxicity and neither accidental infection nor skin exposure presents a serious hazard.

Machines, Materials and Equipment

Printing on Plastics

A new technique for printing sheet plastics, said to reduce the cost by up to 75%, has been evolved by Inchbrook Printers Ltd., Wooton-under-Edge, Glos.

A combination of special inks and varnishes and a new handling procedure has enabled the speed and versatility of offset-lithography to be used in the printing of plastics. The firm developed the technique for printing, in four colours, .025in. white polystyrene sheet which is subsequently vacuum formed to produce three-dimensional advertising novelties. Despite the stresses of vacuum forming the printed image is said to be superior in many respects to that obtained by the accepted printing processes for plastics. The biggest cost savings occur on the large-run jobs but the new method means that all the advantages of a conventional paper printing process can be applied to plastics. Half-tones and superimposed images are no longer a problem and with translucent inks a variety of colour combinations can be obtained from a small number of primary colours.

Publications

Breon Rubber

A German language edition of British Geon Ltd.'s technical booklet on Breon Nitrile Rubbers has just been published by the company.

This range of oil-resisting synthetic rubbers are copolymers of butadiene and acrylonitrile, used in the manufacture of flexible fuel tanks, fuel hose, oil seals, gaskets, sealing rings and similar applications where maximum oil and petrol resistance is required.

The booklet describes the nature and properties of the rubber, giving information on compounding and processing.

Copies can be obtained from Rasmus Gebruder and Co., Streitshof, Poststrasse 14, Hamburg, 36, West Germany; Keyser and Mackay, Claridonstrasse 36, Luxor-Haus, Zurich 2, Switzerland, or direct from British Geon Ltd., Devonshire House, Piccadilly, London, W.1.

Plastics Developments

A colourful booklet called 'Developments in Plastics' has been issued by British Xylonite Ltd. It is concerned with thermoplastic materials and possible applications for them.

The publication contains information on the growth of the company, its production and productivity and its sales and technical services. Aided by many photographs, the booklet describes BX products and their uses. The properties of the products mentioned are clearly laid out in tables and details of how they are supplied are recorded.

Copies of this publication can be obtained from the Publicity Department, BX Plastics Ltd., Higham Station Avenue, E.4.

New Delivery Hose

A few months ago, George Angus and Co. Ltd. developed Drakeline, a light flexible delivery hose for oil and chemical products for sale in overseas markets. This combines an all-synthetic woven jacket with external plastics coating and a seamless rubber lining. This is now available on the home market, and a leaflet is available from the company at Angus House, 152-158 Westgate Road, Newcastle-upon-Tyne, 1, P.O. Box 139, which gives details of performance and the products for which it is suitable.

Rubber Markets

LONDON

The London rubber market was uneventful during the past week, especially in the light of holidays in both Singapore and New York, at certain days during the period. No fresh orders were reported although small covering interest in forward terminal positions was noted. Additionally, limited demand for higher grade sheets was also evident at one stage. Despite minor fluctuations the market finished the period with little net change.

Latest prices are as follows:

No. 1 RSS Spot: 26-26¼d.

Settlement House:

July 26⅛d.-26⅜d.

August 26⅛d.-26⅜d.

September 26⅛d.-26⅜d.

July/September 26⅛d.-26⅜d.

October/December 26⅛d.-26⅜d.

January/March (1962) 26⅛d.-26⅜d.

April/June 26⅛d.-26¼d.

No. 1 RSS cif basis ports:

June 25⅞d.-26d.

July 25⅞d.-26d.

Godown:

June 87⅛ Straits cents nominal.

LATEX

Centrifuged 60% latex per gallon in drums, seller, July, August, 14s. 10d., cif European ports. Spot, seller, 15s. 3d. Bulk, seller, d.w. 14s. 10d. Creamed, seller, 14s. 7d., nominal. Normal, seller, July, August, 12s.

NEW YORK

Market closed.

SINGAPORE

After opening uncertainly on May 29 the market was dull until late in the morning when some enquiry for lower sheet steadied values. In the afternoon, steady conditions prevailed initially but upcountry selling later depressed prices. Interest in lower sheets was small. After hours, the market was quiet and slightly easier.

	Malayan cents per lb., fob Malayan ports to open ports	
	May 29	Prev. Close
No. 1 RSS, June	86¼–87¼	87¼–87½
July	87¼–87½	87½–88
No. 2 RSS, June	86½–87	87–87½
No. 3 RSS, June	86¼–86½	86½–87¼
No. 4 RSS, June	83¼–84¼	83¼–84¼
No. 5 RSS, June	74¼–75¼	74¼–75¼
No. 1 RSS, Spot	87 –87¼	87¼–88
No. 3 blanket thick remilled crepe, June	72¼–73¼	72½–73½
No. 1 fine pale crepe, June	92¼–93¼	92¼–93¼
2x Thin brown crepe, June	70 –71	70¼–71¼

Tendency: Quiet and slightly easier.

The Industries Syndicate quote latex, native produce, 60% centrifugal, packed in rectangular drums, fob, at 172.20d. per gallon.

AMSTERDAM

The Amsterdam rubber market ruled as under on May 29:

	Guilders per kilo	
No. 1 RMA:	May 29	Previous
May	2.40	2.42
June	2.40	2.42
July	2.41	2.43
August	2.41	2.43
September	2.41	2.43
July/September	2.41	2.43

Sales: Nil. Tone: Dull.

DJAKARTA

Transactions on May 29 totalled about 5 tons of sheet No. 1 at 33.50 rupiahs per kilo for ready delivery. Generally, neither buyers nor sellers showed any interest. The close was very quiet.

	Rupiahs per kilo	
	May 29	Previous
Spot No. 1 Priok	33.00b	33.00b
Spot No. 2 Priok	32.00b	32.00b
Spot No. 3 Priok	31.00b	31.00b
No. 1 fine pale crepe, spot	31.00b	31.00b

Tendency: Very steady.

BANGKOK

The price of No. 1 RSS at Bangkok on May 30 was 27.87½ (28.00) US cents per lb.

CEYLON

The price of No. 1 RSS at Colombo on May 29 was 105¾ (106¾) Ceylon cents per lb.

Technical Training Week

Factories and research stations of The Distillers Co. Ltd. gave displays and exhibitions to interested visitors as part of this week's Commonwealth technical training programme.

Full co-operation with local authorities resulted in technical college students and others being able to assess career opportunities in the company's wide range of interests in the chemical and plastics industries.

The programme included safety film shows and training schemes.

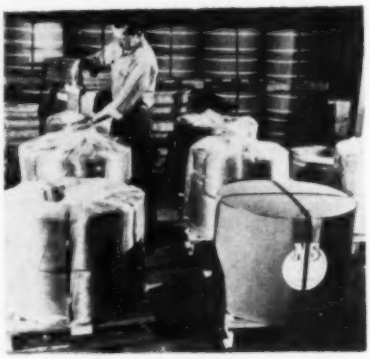
New Poly-Tainers

Poly-Tainer bottles of Rigidex high density polythene are now being produced in gallon and half-gallon sizes by the plastics group of Metal Box Co..

The bottle's neck is closed by an efficient two-start compression moulded black polystyrene cap with special knurling, fitted with a wad faced either with polythene or Vinylite.

Keeping Moisture Out

Packaging with polythene film has resulted in an exceptionally reliable system of keeping out corroding moisture and humidity in the shipping of coiled wire. A fresh packaging method became imperative for an American wire manufacturer when corrosion of coiled tyre bead wire kept customers from building inventories, creating added storage and production-line delays.



Sealing the polythene containers round the wire coils

In this system a pair of wire coils is set inside a polythene bag, and a desiccant is then inserted, air withdrawn, and the bag sealed. Cardboard wrappers go on next, and the coils are steel-strapped to a pallet.

Rubber Requirements for 1961

The Management Committee of the International Rubber Study Group has examined the statistical position of rubber and made estimates for natural and synthetic rubber requirements and supply during 1961. It was estimated that the world might consume (*i.e.* turn into manufactured goods) some 2,037,000 long tons of natural rubber, and 1,865,000 long tons of synthetic rubber, apart from synthetic rubber produced in non-member countries. In regard to production, it was estimated that the world production of natural rubber would be 2,035,000 long tons and synthetic rubber production in member countries would be 1,897,000 long tons, while the annual production capacity of synthetic rubber in member countries is of the order of 2.6m. long tons. In addition it was estimated that some 30,000 long tons of natural rubber would be delivered from government stockpiles. The US tops the list with estimated requirements of 1,480,000 long tons, followed by the UK with 288,000. Other consumers expected to top the 200,000 ton mark are Germany, Japan and France.

Synthetic Rubber Prices

Prices of synthetic rubbers appear regularly in RUBBER AND PLASTICS WEEKLY *in the first week of each month. It will be appreciated if suppliers will give notification of any price changes or additions to their range. C/f duty paid quotations are subject to slight variation due to exchange, ocean freight and insurance fluctuations. Prices are in pence per lb., except where otherwise stated. Grades are expressed as follows:* 1001/2/6 = *grades* 1001, 1002 *and* 1006.

(e-qdp)—Ex-quay duty paid (cifUKdp)—cif UK duty paid (e-i)—Ex-installation (ddp)—Delivered duty paid (e-sUK)—Ex-store UK (ex-wUK)—Ex-warehouse UK (d)—Delivered BM—black masterbatch CBM—cold, black masterbatch CNP—cold, non-pigmented CNS—cold, non-staining COE—cold, oil extended COELC—cold, oil extended, light coloured CO/BM—cold, oil/black masterbatch CPOE—cold, pigmented, oil extended CRE—cold, rosin extended dw—Dry weight HN—high nitrile HNP—high nitrile, powder HP—hot, pigmented HS—high styrene HMW—high mol. wt. LMW—low mol. wt. MHN—medium high nitrile MLN—medium low nitrile MMW—medium molecular weight MN—medium nitrile NS—non-staining TS—total solids RTV—room temp. vulc.

SBR TYPES AND HIGH-STYRENE RUBBER

Ameripol (Goodrich Gulf) (e-qdp)

1000/1/6/7	Hot, non-oil ..	22.50
1002/12	,, ,, ..	22.75
1009	,, ,, ..	24.25
1011	,, ,, ..	23.25
1013	,, ,, ..	23.50
1019	,, ,, ..	24.75
1006/12	Hot, crumb ..	23.00
1009	,, ,, ..	25.00
1013	,, ,, ..	24.00
1500/1/2/9/11	Cold, non-oil ..	22.50
1503	,, ,, ..	24.50
4600G2, 4604	,, ,, ..	22.50
1703	COE, 25% oil	19.75
1705	,, ,, ,,	19.50
1707/8	,, 37.5% ,,	18.25
1710/12	,, ,, ,,	18.00
4700	,, 50% ,,	16.75

ASRC (American Synthetic Rubber Corpn.) (e-sUK)

1004/6	Hot, non-oil	22.25
1009	,, ,, ...	24.0
1018	,, ,, ...	24.75
1019	,, ,, ...	24.5
1500/2/7	Cold, non-oil	22.25
1503	,, ...	24.25
1703	COE	20.5
1708	,, ...	18.0
1712	,, ...	17.75
1713	,, ...	16.75
3014	Hot, non-oil	25.75
3105/6	Cold, non-Oil	22.25
3110	,, ,, ...	24.0

Cariflex (Shell Chemical) (e-sUK)

S-1000	Hot	22.25
S-1002	,, ...	23.375
S-1006	,, ...	22.25
S-1009/11/13	,, ...	24.0
S-1500/2/9	Cold	22.25
S-1600/2	CBM	19.625
S-1605	,, ...	19.375
S-1606	,, ...	18.75
S-7652	,, ...	20.0
S-1703	COE	19.25
S-1707	,, ...	18.0
S-1709/12	,, ...	17.75
S-1803	COBM	17.875
S-1806	,, ...	16.625
S-1807	,, ...	17.375
S-1808	,, ...	15.25

FR-S (Firestone) (delUK*)

1000/1/4/6/7 and 195	Hot ..	22.50
1500/2 and 146	Cold	22.50
1703 and 173	OE ..	19.11
1710/12 and 184	,, ..	18.00
178	,, ..	18.25
201	,, ..	16.71
1009 UK Specialty	.....	23.06
1012 ,, ,,	.....	22.59
1013 ,, ,,	.....	23.59
1014 ,, ,,	.....	26.18
181 ,, ,,	.....	22.50
182 ,, ,,	.....	23.29
147 ,, ,,	.....	20.94
158 ,, ,,	.....	28.00
158-S	.....	27.50

*Import Duty not included

Int. Synthetic Rubber (d)

Intol 1500/2	22.5
Intol 1509	22.5
Intol 1570	23.5
Intol 1006	22.5
Intol 1710	18.0
Intol 1712	18.0
Intol 1778	18.25

Naugapol (Naugatuck Chemical International) (ex-WUK)

1016/9	28.5
1018	29.0
6003	29.0
1022	32.25
1023	34.5
1503	28.25
6102	28.25
1504	36.5
6101	24.5
6100	33.5
K-45	28.25
K-50	28.75
KO-50	29.25
1015	36.5
6004	27.0

ANIC (e-qdp)

1500	22.25
1502	22.25
1708	18.00
1712	17.75
6630	23.25
6632	22.25
6700	16.375

Philprene (Phillips) (d)

1000/6	Hot, non-pig.	22.50
1009	,, ,, ...	24.25
1018	,, ,, ...	26.97
1019	,, ,, ...	26.50
6701	,, ,, ...	24.23
1500/2	CNP	22.50
1503	,, ...	26.27
6630	,, ...	25.18
6632	,, ...	24.23
1601	CP	19.70
1603	,, ...	19.80
1605	,, ...	19.625
1606	,, ...	19.00
1608	,, ...	18.90
1609	,, ...	21.12
6662	,, ...	18.90
6655	,, ...	19.80
1703	COE	20.75
1708	,, ...	18.25
1712	,, ...	18.00
6700	,, ...	18.01
1803	CPOE	18.125
1805	,, ...	16.11
1808	,, ...	16.50
6608	,, ...	15.27
6753	,, ...	15.61
6754	,, ...	15.45
6755	,, ...	17.68

Plioflex (Goodyear) (ex-wUK)

1006	HNP	22.25
1500/2/7/8	CNP	22.25
1006	S	22.75
1703	COE	19.25
1710/12	,, ...	17.75
1773	COELC	19.25
1778	,, ...	18.0
B—6	.....	27.5
B—5	.....	28.0

Polysar (Polymer UK) (e-sUK)

S Hot	22.25
S-630 Hot	22.25
Kryflex 200 Cold	23.5
Krylene	22.25
Krylene NS	22.25
Krylene 602 Cold	22.25
Krynol 651 COE	17.75
Krynol 652 ,,	18.0
S-X 371 Process Aid	24.0

Synpol (Texas-US Chemical) (e-qdp)

1000/1	Hot	22.25
1002	,, ...	22.47
1006/7	,, ...	22.25
1009	,, ...	22.81
1012	,, ...	22.38
1013/61	,, ...	22.25
X274	,, ...	23.45
8000	,, ...	22.25
1500/02/51	Cold	22.25
1703	COE	19.25
1707/8	,, ...	18.0
1711	,, ...	17.88
1712	,, ...	17.75
8200	,, ...	18.0
8201	,, ...	16.6
8202	,, ...	16.38
8152	CBM	18.6
8151	COBM	18.2
8253	,, ...	15.84
8254	,, ...	15.45
8255	,, ...	14.8
8267	,, ...	16.4

(Masterbatch prices US cents per lb. fas Gulf ports)

SBR LATICES

Copo (Copolymer) (cifUKdp)
(10-ton lots)

2101	(dw)	46.3
X-765	,, ...	40.8
X-800	,, ...	37.2
2102/5	,, ...	38.0

Pliolite Rubber (Goodyear) (d)

2000	40

Latex (dw)

2001/4/5/8	40
5350	40

Pliolite Resin (Goodyear) (d)

101A	(dw)	44
150	,, ...	50
151	,, ...	35
160	,, ...	50
170	,, ...	50

Hycar (B. F. Goodrich) (ddp)

2507 (HS) dw	48

Polysar (Polymer UK) (e-sUK)

Latex, type IV	32.5 TS
Latex, type 722	31.75 TS
(Non-returnable 45-gallon drums)	
	(e-i)
Latex, type 722 (bulk quantities)	28.75 TS

Int. Synthetic Rubber (ex-wks)

Intol Latex M23B/R23/P28	22.25
Intol Latex 62A	27.0

Dylex (Koppers Int. CA) (fas)

K-42A/52/31/900	31.6

ACRYLONITRILE TYPES

Butaprene N (Firestone) (cifUKdp)

NL	52.5
NAA	56.25
NF	51.5
NXM	60.18

Chemigum (e-s)

N—1	75
N—3A	52
N—5	52
N—6G/7/8/600X	45

Hycar (British Geon) (UKd)
(500-lb. lots and over)

1001	High Nitrile Hot	52
1041	,, ,, Cold	52
1002	MHN Hot	45
1042	,, Cold	45

Hycar (B. F. Goodrich) (ddp)
(500-lb. lots and over)

1411	HNP	66
1432	MHN (crumb)	64
1072	,, (carboxyl)	66
1312	,, (liquid)	55
1043	MLN	51
1014	Low Nitrile	61

I.C.I. (min., 5-cwt. lots) (UKd)

Butakon A-4051 HN Cold	52
Butakon A-3051 MN Cold	45
Butakon A-3002 ,, ,,	45

Paracril (US Rubber) (dwe-sUK)

18-80	Low Nitrile	61
AJ	,, ,, ...	50
B	MLN	51
BJ	,, ...	51
BLT	,, Cold	51
BJLT	,, ,, ...	51
C	MHN	59
CLT	,, Cold	59
CV	,, (crumb)	63
D	High Nitrile	67
ALT	.....	51
OZO	.....	47

Polysar (Polymer UK) (d)

Krynac 800 MN	45
Krynac 802 LN	45
Krynac 803 MN (low Mooney)	45
Krynac 801 HN	52
Krynac 804 (MN-cross linked)	45

ACRYLONITRILE LATICES

Butaprene N (Firestone) (cifUKdp)

N-300 (dw)	53
N-400 ,,	60.5

Chemigum Latex (Goodyear) (d)

200	(dw)	65
235/6	CHS ,, ...	60
245	B ,, ...	52
245 6/7/8	CHS ,, ...	52

Hycar (B.F. Goodrich) (ddp)
(dry weight, drum lots)

1551 High Nitrile	66
1552 MHN	57

Hycar (British Geon) (UKd)
(dry weight, 3 drums and over)

1561	High Nitrile	60
1571	,, ,, (carboxyl)	60
1562	MHN	52
1577	(modified)	52

ACRYLIC TYPES

Hycar (B. F. Goodrich) (ddp)

4021 Slab, 500 lb. and over	144
4501 Latex, dry weight	96

BUTYL TYPES

Esso (e-sUK)

Regular 035/150/215	21.75
Regular 217/8	21.75
Regular 325	21.75
Non-staining 165	22.75
Non-staining 268	22.75
Non-staining 365	22.75

Polysar (Polymer UK) (e-sUK)

Butyl 100/200/300	.....	21.75
Butyl 301/400	NS	21.75
Butyl 101	NS	26.25
Butyl 402	NS	22.5

Hycar (B. F. Goodrich) (ddp)
(500 lb. and over)

2202 Brominated	68

NEOPRENES

(ddp)

W	(dwdel) ..	42.62
WHV	,, ...	38.5
WRT	,, ...	48.37
WX/GN/GNA	,, ...	44.62
GRT and S	,, ...	45.62
AC	,, ...	57.125
KNR	,, ...	75.62
AC 'M' and 'S'	,, ...	57.125
CG/AD	,, ...	57.125

The above prices refer to neoprene produced in the U.S.A. Prices of neoprene types produced at Du Pont's Maydown, Northern Ireland, plant are as follows:

W	(dwdel)	38.5
WRT	,, ...	44.0
WX	,, ...	40.5

Latices—Dry
(per lb. del, min., 50 lb.)

571	49.75
842A	49.75
572	51.25
601A	51.87
650	54.125
735	51.25
736	51.25
950	58.25
60	51.87
750	51.25
635	53.62

SILICONE RUBBERS

Midland Silicones
(500-lb. lots del)

Stocks	16s. 6d. to 35s.
Pastes	26s. to 35s.
Gums and base stock	36s. to 42s.
Cold-curing silicone rubber	20s. and 23d. 6d.

I.C.I. Silicones

Gums (40-lb. lots del)	39s. 6d.-47s.
Stocks (250-lb. lots del)	22s.-35s.
Pastes (1000-lb. lots del)	27s.6d.-35s.9d.
Silcoset (RTV) (250-lb. lots del)	21s. to 24s.

REINFORCING RESINS AND RUBBERS

I.C.I. (min., 2-ton lots) (UKd)

Butakon S-8551	36.5
Butakon S-7001	33.5

Hycar (B.F. Goodrich) (ddp)

2007 (powder)	42.5

Pliolite (Goodyear) (d)

S—6B	36.5

Polysar (Polymer UK) (e-sUK)

SS-250 HS (bale)	27.25
SS-250 ,, (flake)	27.5
Kryflex 252 HS	25.5
Kryflex 202 (HMW Cold polymerized)	25.75

Cariflex (Shell) (e-sUK)

SP-103	27.75

Cyclite (Durham Raw Materials) 42

HYPALON

(ddp)

20	48
30	60.25
40	50.75

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

(803,198). Chemical products for use in the manufacture of plastics, rubber and of lacquer; bleaching agents and optical bleaching agents, all for use in industrial and manufacturing processes. Vereinigte Ultramarinfabriken Aktiengesellschaft, Hohenzollernring 85-87, Koln, Germany. (Class 1; May 10 1961.)

(803,200). Chemical products for use in the manufacture of plastics, rubber and of lacquer; bleaching agents and optical bleaching agents, all for use in industrial and manufacturing processes. Vereinigte Ultramarinfabriken Aktiengesellschaft, Hohenzollernring 85-87, Koln, Germany. (Class 1; May 10 1961.)

Flamingo (806,979). Plastics and compositions containing plastics, all included in Class 1. Flamingo Foam Ltd., Monsanto House, 10-18 Victoria Street, London, S.W.1. (Class 1; May 10 1961.)

Borvitex (811,478). Polyvinyl acetate dispersions, being chemical products for use in dressing textiles. Aktieselskapet Borregaard, Sarpsborg, Norway. (Class 1; May 10 1961.)

Reochlor (812,436). Plasticizers, being chemical substances containing chlorine, for use in manufacture. J. R. Geigy Société Anonyme, 215 Schwarzwaldallee, Basle 16, Switzerland. (Class 1; May 10 1961.)

KRISS-KROSS BY FABRON (790,474). Dust covers of flexible transparent plastics included in Class 17. Commercial Plastics Ltd., Willington Quay, Wallsend-on-Tyne, Northumberland. (Class 17; May 10 1961.)

Aeroflex (811,757). Imitation leather materials being principally or wholly of plastics. Bernard Wardle (Everflex) Ltd., Peblig Mill, Caernarvon, North Wales. (Class 18; May 10 1961.)

(B772,067). Machines for use in the manufacture, forming and processing of plastics, and parts of all such machines included in Class 7. R. H. Windsor Ltd., Leatherhead Road, South Chessington, Surrey. (Class 7; May 3 1961.)

Aircomb (B792,169). Honeycomb core material made of paper impregnated with phenolic resin. Douglas Aircraft Co. Inc., 3000 Ocean Park Boulevard, City of Santa Monica, State of California, USA. (Class 16; May 3 1961.)

Renopac (812,327). Paper and plastics in sheet form, and articles made from paper and from plastics; all included in Class 16. John Waddington Ltd., Waddington's Printing Works, Wakefield Road, Leeds, 10, Yorkshire. (Class 16; May 3 1961.)

Tip-Gar (793,416). Rubber covers for the mouthpieces of whistles. Suren Manoog Seron and Blanche Emanuelson Seron, trading as Seron Manufacturing Co., 432 Barber Buildings, Joliet, State of Illinois, USA. (Class 17; May 3 1961.)

Renopac (812,328). Plastics included in Class 17, in the form of sheets, blocks, rods and tubes. John Waddington Ltd., Waddington's Printing Works, Wakefield Road, Leeds, 10, Yorkshire. (Class 17; May 3 1961.)

Riv (812,788). Sheets, panels and boards, all made of laminations of plastics and being for use in building. Riv Officine Di Villar Perosa Societa Per Azioni, 53 Via Mazzini, Turin, Italy. (Class 19; May 3 1961.)

Increases of Capital

Elpitinja Rubber Holdings Ltd. (660,509). 13 Rood Lane, E.C.3. Increased on August 19 1960, by £119,900 in 1,199,000 shares of 2s., beyond the registered capital of £100.

Schulman Plastic Processers Ltd. (661,032). 37 King Street, W.C.2. Increased on August 23 1960, by £9,900 in £1 ordinary shares, beyond the registered capital of £100.

Cranran Ltd. (695,982), plastics article manufacturers, etc., Greek Street, Liverpool, 3. Increased on September 5 1960, by £4,900 in £1 ordinary shares, beyond the registered capital of £100.

Changes of Name

H. Horne and Sons (Warwick Court) Ltd. (372,016). 329 High Holborn, W.C.1. Name changed to H. Horne (Plastics) Ltd. on August 25 1960.

Same Again

C. E. Joslin, vice-president and general manager of the American Biltrite Rubber Co. (Canada) Ltd., Sherbrooke, has been re-elected president of the Rubber Association of Canada, the national trade association of the rubber industry in Canada.

Solution to RPW Crossword

(See page 848 this issue)

ACROSS: 2, Castor Oil. 7, Isle. 8, Ideal. 10, Scilly. 12, Alice. 13, Salute. 14, Little. 15, Patio. 16, Entire. 18, SEATO. 20, Arts. 21, Polyester.

DOWN: 1, Isocyanate. 2, Cell. 3, Stay. 4, Oxidation. 5, Ore. 6, Lil. 9, Accelerate. 11, Lithopone. 16, Exit. 17, Tear. 18, Sup. 19, All.

NEW COMPANIES

Doverstrand Ltd. (692,510). May 12. Capital: £72,000 in 35,999 'A' ordinary, 35,999 'B' ordinary and two 'C' shares of £1. To carry on the business of manufacturers, importers and exporters of, and dealers in, rubber, gutta percha, india-rubber, vulcanized rubber, vulcanite, ebonite, celluloid, plastics and plastics materials, etc. The first directors to be appointed by the subscribers. Regd. office: 51/5 Strand, W.C.2.

Alfred Hanks (Birmingham) Ltd. (692,526). May 12. Capital: £2,000 in £1 shares. To carry on the business of agents for the import, export, purchase and sale of manufactured goods, including rubber, plastics, woods and all other kinds of materials; electricians, electrical engineers, etc. The first directors are to be appointed by the subscribers.

Calican Ltd. (692,542). May 12. Capital: £100 in £1 shares. To carry on the business of manufacturers of, and wholesale and retail dealers in, hardware, tools, ironmongery, plastics, glues, adhesives, etc. The first directors are to be appointed by the subscribers. Regd. office: 13 Well Court, Bow Lane, E.C.4.

Tidiwear (Sales) Ltd. (692,662). May 15. Capital: £100 in £1 shares. To act as a sales organization for firms and companies, and carry on the business of merchants, factors, importers and exporters of, and dealers in, plastics clothing, waterproof goods, outer- and under-wear, etc. The first directors are to be appointed by the subscribers. Regd. office: 42 Welbeck Street, W.1.

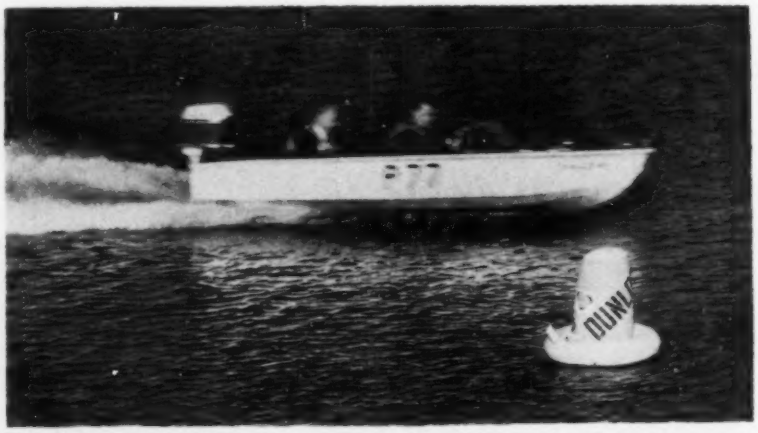
Alendrite Plastics Ltd. (692,373). May 11. Capital: £100 in £1 shares. To carry on the business of manufacturers and repairers of, and wholesale and retail dealers in, plastics and synthetic substances, rubber, balata, gutta percha, etc. The first directors are to be appointed by the subscribers. Regd. office: 13 Well Court, Bow Lane, E.C.4.

M.R.P.B. Products Ltd. (691,722). May 5. Capital: £1,000 in £1 shares. To carry on in the Federation of Malaya or in any other part of the world any business connected with rubber, etc. The directors are: William J. Woodhouse, Northlands, Warnham, Sussex; Alfred J. Stevens, 37 Burnt Hill Road, Farnham; John O. J. Stevens and Harry Scully. Regd. office: 4 and 6 High Street, Alton, Hants.

Latest Wills

Angus Wallace Gillespie, of Arrow House, Manor Close, East Horsley, Surrey, formerly of Dunlop Rubber Co. (India) Ltd., Calcutta, who died on December 23 1960, left personal estate in England and Scotland valued at £33,670.

Victor Edward Winbolt, of Up Yonder, Worting Road, Basingstoke, Hants, chief engineer of Blue Peter Retreads Ltd., Basingstoke, who died on November 26 1960, left £10,050 net value.



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ASSISTANT chief chemist. Applications are invited from experienced chemists with a good knowledge of rubber and plastics technology.—Apply giving details of age, experience, qualifications, salary, etc., to Personnel Manager, Fireproof Tanks Ltd., The Airport, Portsmouth, Hants. (1069)

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THE NORTH BRITISH RUBBER CO. LTD.

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PRODUCTION SUPERINTENDENT for the HOSE DEPARTMENT. The Company, which is affiliated to the U.S. Rubber Company, would like to hear from keen production men with experience in the manufacture of machine made General, Oil and Braided Hoses. Mixing and Calendering experience a decided asset. The position carries succession prospects and a good salary with superannuation, free life assurance and conditions of service commensurate with the standing of the Company.

Applications, which will be treated in strictest confidence, to Director of Personnel,

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Castle Mills,
P.O. Box 47,
EDINBURGH, 3. (1086)

CHANCE of a lifetime for a keen, energetic executive with administrative qualifications and experience and contacts in rubber and plastics. There is an opening to take charge of the Manchester office of a well known supply company. Generous salary and bonuses.—Reply in confidence Box 1090. (1090)

LATEX technologist required to fill important managerial position. Our staff has been advised.—Box 1093. (1093)

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Applications are invited for the following positions within P. B. Cow (Plastics) Limited:—

Product Development Technicians for the extrusion and general fabrication departments.

Successful applicants should have an ability to solve technical and development problems associated with plastic extrusion production. Basic technical training up to Intermediate Degree standard is required and keenness, a practical outlook, some engineering aptitude and a sound practical knowledge of extrusion and fabrication of the following materials, i.e., flexible PVC, rigid PVC and Polyethylenes are essential.

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Applications in confidence to:—

P. B. Cow (Plastics) Limited,
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Trading Estate,
Slough, Bucks.

Marked for attention of Technical Director. (1038)

APPOINTMENTS VACANT (continued)

VACANCY for young rubber technologist with initiative and some experience in footwear. Salary according to experience. South London.—Box 1085. (1085)

MSL *have been retained to advise on this appointment.*

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London Area

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Candidates must have a degree in chemistry and should have experience of both technical and commercial development of new products. Extensive knowledge of thermoplastic resin formulations, compounding techniques and performance is essential. Familiarity with surface coating methods would be useful.

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(1084)

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WORKS manager, rubber/plastics, requires similar position, Surrey, Kent, Sussex area. Fully conversant all aspects of production, development, tool design and manufacture, planning, cost control, installation of plant, good organiser.—Box 1073.

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6d. a word, Minimum 12/6 Box 2/-

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MELLOR Equipment Ltd., Springfield Lane, Salford, 3, buy used machinery of Francis Shaw and Joseph Robinson manufacture.—Telephone Manchester, Blackfriars 1866. (1061)

WANTED. Small cracker mill, bowls about 18in. x 9in.—Full details to Box 1056. (1056)

WANTED. Small laboratory mill, rolls approx. 12in. x 6in. dia. Must be in good condition.—Box 1092. (1092)

Butyl

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MANUFACTURERS of roughing machines for rubber sheeting, sponge rubber, splitting machines, leather cloth plant, embossing plates and rollers, spreading machines and presses.—G. L. Murphy Ltd., Imperial Works, Menston, Nr. Leeds. (238R)

PLASTIC injection moulding machine, Windsor 6oz. model SH6. Steam boilers, 200lbs. to 16,000lbs. evaporation; Economic, Cochran, Lancashire; automatic oil and stoker firing; delivery and installation anywhere. Insurance approved and 12 months' guarantee. Highest part exchange valuations.—Fred Watkins (Enginering) Ltd., Coleford, Glos. Telephone: Coleford 2271 (5 lines). (1023)

'WINDSOR' injection moulding machines. Five SH.3, two SH4, one SH.10. Downstroking hydraulic bakelite moulding presses. Maximum pressure about 30 tons. Four 2½in. pillars. Between pillars 11½in. x 7in. Platen 15½in. x 11in. Main ram: diameter 7in., stroke 10in. Several machines available.—Muncaster Machine Tools Ltd., Mary Street, Manchester, 3. Phone DEAnsgate 5864/5. (1064)

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